

September 2001 ECONOMIC AND REVENUE FORECAST

FISCAL YEAR 2002
1ST QUARTER



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Cover photo: Geoduck clams are a major source of revenue from state-owned aquatic lands managed by the Department of Natural Resources

September 2001 ECONOMIC AND REVENUE FORECAST

FISCAL YEAR 2002
1ST QUARTER

prepared by
Bruce P. Glass
Economics Team Leader
Office of Budget and Economics
September 2001

Persons needing this information
in an alternate format may call
(360) 705-0582 or TTY (360) 902-1125



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Accurate reproduction of information in this forecast is welcomed.
Acknowledgment of the source would be appreciated.

ACKNOWLEDGMENTS

The quarterly revenue forecast is a collaborative effort. It is the product of information provided by private individuals and organizations, and DNR staff. Without their contributions this forecast could not be completed.

An absolutely critical component of this forecasting work are the purchasers of DNR timber. These busy individuals and companies willingly provide information that is essential to the process of estimating harvest volumes.

Many DNR staff also contribute to the forecast. Those persons who provide data or forecasts of revenue flows for their areas of responsibility make an especially significant contribution. These people include Wayne Hardy, Paul Penhallegon, Jon Luedecker, Ellis Vonheeder, Bob Suda, Rod Rennie, and Mark Savage. Also, other DNR staff have provided valuable and constructive feedback on drafts of this forecast report, and I thank Phil Aust, Leigh Espy, Jim Hotvedt, David Larsen, Quynh Nguyen, Jim Smego, Loren Stern, and Bob van Schoorl for their comments in this regard.

I am grateful to Jennifer Quartano for her help and initiative in conducting the purchaser survey efficiently and effectively.

Bruce P. Glass
September 18, 2001

PREFACE

This forecast projects revenues from Washington state trust lands managed by the Department of Natural Resources. These monies are distributed to accounts associated with specific management activities and the trust lands from which revenues are expected to be generated. The department projects revenues quarterly to provide information for trust beneficiaries as well as for long-term budgeting purposes.

This forecast covers fiscal years (FY) ending June 2002 through June 2005. The baseline date for this September 2001 forecast is June 30, 2001, the end of FY 2001. While sales and revenue data are current as of this date, the forecasts are based on the most up-to-date data available at the time of their estimation (i.e., after the baseline date). Macroeconomic and market outlook data are the most up to date available at the time the forecast was written.

Unless otherwise indicated, values are expressed in nominal terms, without adjustment for inflation. Interpretations of trends in the forecast therefore require care in separating inflationary changes in the value of money over time from changes attributable to other economic influences.

FORECAST CALENDAR

The forecast calendar for future DNR Economic and Revenue forecasts is shown in the table below. The DNR forecasts provide information that is used in the state-wide Washington Economic and Revenue Forecasts carried out by the Office of the Forecast Council. The timing for the DNR forecast is therefore determined by the schedule of the state-wide forecast, prescribed by RCW 82.33.020. The calendar prescribed by RCW 82.33.020 is reflected in the release date, i.e., when preliminary revenue forecast estimates will be available. Publication of the actual forecast document follows at a later date.

Forecast title	Baseline date	Release date	Publication date (approx.)
November 2001	End Q1, FY 2001	November 20, 2001	November 30, 2001
March 2002	End Q2, FY 2001	March 20, 2002	March 29, 2002
June 2002	End Q3, FY 2001	June 20, 2002	June 28, 2002
September 2002	End Q4, FY 2001	September 20, 2002	September 27, 2002

EXECUTIVE SUMMARY

- This economic and revenue forecast was prepared prior to the events of September 11, 2001, in which four planes were hijacked and deliberately crashed, with major loss of life. The effects of these terrorist actions have been substantial in both psychological and material senses, and the effects will continue to reverberate for a considerable time. However, while it is still too soon to assess the economic impacts of these events on the US and international economies, the impacts may not be as negative as first thought given the state of and trends in certain economic indicators (e.g., sustained consumption expenditures, low inventory levels and interest rates, steady housing starts). As far as the US economy is concerned, confidence probably will be key in determining how long the economic slowdown that was already occurring prior to September 11, actually continues after this fateful date. Perhaps the most visible economic external sign of this confidence is consumer expenditure which accounts for more than 60% of US gross domestic product. Should consumer expenditure recover quickly in the wake of these terrorist actions, it seems likely that the economic impacts of the terrorist actions will have run their course.
- The baseline date for this forecast is the end of Fiscal Year (FY) 2001, i.e., June 30, 2001. Data extracted from the department's management information systems and presented in this forecast are current as of that date. Other data used in the forecast, especially those used in describing the economic backdrop and those data used specifically for forecasting purposes, are the most up-to-date available at the time the forecast is actually compiled.
- Total revenues from all DNR management activities (upland and aquatic, excluding trust land transfer payments) are forecast to decrease through FY 2002 from about \$203 million in FY 2001 to a low of \$193 million in FY 2003. Revenues are then forecast to increase, reaching \$231 million in FY 2005. The overall trend in revenues reflects anticipated fluctuations in residential construction, timber sale volumes and prices, and projected timber removals.
- In accordance with total revenues, trust beneficiary revenues are forecast to decrease through FY 2002 from \$153 million in FY 2001 to a low of \$144 million in FY 2003. Revenues are then forecast to increase, reaching about \$172 million in FY 2005. Changes in these revenue forecasts compared with the June 2001 forecast reflect the changes and trends in total revenues mentioned above.
- In accordance with total revenues, management fund revenues are expected to decrease through FY 2002 from \$51 million in FY 2001 to a low of \$49 million in FY 2003. Revenues are then forecast to increase, reaching about \$59 million in FY 2005. Changes in these revenue forecasts compared with the June 2001 forecast reflect the changes and trends in total revenues mentioned above.

(continues on page vi)

(continues from page v)

- Timber removal revenues comprise the bulk of DNR's revenue earnings. In line with anticipated trends in timber sale volumes and prices, and timber removal volumes, removal revenues are expected to decrease through FY 2002 from \$171 million in FY 2001 to a low of \$156 million in FY 2003. Removal revenues are then forecast to increase, reaching \$189 million in FY 2005.
- Non-timber revenues are expected to grow steadily over the forecast period. Aquatic revenues are expected to increase from about \$14 million in FY 2001 to nearly \$18 million in FY 2005, while other (upland) non-timber revenues are forecast to grow from over \$19 million in FY 2001 to nearly \$24 million in FY 2005. Geoduck clams and water-dependent leases are forecast to be the most rapidly growing sources of aquatic revenue, while communications site leases, commercial real estate leases, and minerals sales and royalties are forecast to be the fastest growing sources of upland non-timber revenues. Overall, revenues from non-timber activities are small and relatively stable compared with timber revenues.
- Major factors contributing to the uncertainty surrounding this September 2001 forecast include: (1) interest rate movements in response to inflation and growth trends in the U.S. economy; (2) future trends in consumer spending, particularly as influenced by consumer confidence in the wake of terrorist attacks of September 11, 2001; (3) impacts on domestic (US) log prices of restricting exports of softwood lumber from Canada into the USA; and (4) impacts on timber sale volumes of both changes in business practices and re-estimation of the sustainable harvest attainable on lands managed by the department.

TABLE OF CONTENTS

PREFACE	ii
FORECAST CALENDAR	iii
EXECUTIVE SUMMARY	v
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	xi
ECONOMIC BACKGROUND	
U.S. Economy	1
U.S. Solid Wood Consumption	2
Interaction Between the U.S. and Selected Foreign Economies	3
Japan	4
Canada	4
MARKET OUTLOOKS	
Softwood Sawtimber Supply	6
Softwood Sawtimber Demand	7
Lumber	7
Structural Panels	8
Engineered Wood Products	9
Wood Chips	10
Softwood Sawtimber Stumpage	11
OVERVIEW AND KEY ASSUMPTIONS OF FORECAST	
Overview	13
Key Assumptions	13
1. Timber Sales Volume	14
2. Timber Sales Prices	15
3. Timber Removals From New Sales	16

TABLE OF CONTENTS (cont.)

REVENUE FLOWS BY SOURCE

Overview	18
1. Timber Land Management	19
a. Timber Removal Volumes	19
b. Current Quarter Activity	21
c. Timber Inventory Levels	23
d. Timber Removal Prices	24
e. Timber Removal Revenues	25
2. Management of Upland Non-Timber Resources	25
3. Aquatic Land Management	27
4. Trust Land Transfer Activities	29

REVENUE DISBURSEMENT

Overview	30
1. Revenue Flows to Management Funds	31
2. Revenue Flows To Trust Funds	34

SENSITIVITY ANALYSIS	35
----------------------------	----

ANALYSIS OF SELECTED SCENARIOS	36
--------------------------------------	----

FORECAST CONFIDENCE	38
---------------------------	----

REFERENCES	40
------------------	----

GLOSSARY	42
----------------	----

APPENDIX	45
----------------	----

Forecast performance	46
Tables	52

LIST OF TABLES

	Page
Table 1: Uplands and aquatic lands managed by the Washington State Department of Natural Resources	13
Table 2: Annual sold timber sales volumes--Comparison of September 2001 forecast with June 2001 forecast, 1998-2005	14
Table 3: Annual timber sales prices--Comparison of September 2001 forecast with June 2001 forecast, 1998-2005	15
Table 4: Per cent distributions, by value, of timber removals from new sales: Comparison of current forecast with previous forecast	17
Table 5: Annual revenue flows (cash basis) by source, 1998-2005	18
Table 6: Annual timber removal volumes--Comparison of September 2001 forecast with June 2001 forecast volumes, 1998-2005	20
Table 7: Current quarter activity--Uncut timber under contract by sale expiration date, June quarter, fiscal year 2001	22
Table 8: Annual timber removal prices--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	24
Table 9: Annual timber removal revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	26
Table 10: Annual non-timber upland revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	27
Table 11: Annual aquatic revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	28
Table 12: Annual total management account revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	32
Table 13: Annual revenue flows to upland and aquatic Resource Management Cost Accounts, and the Forest Development Account, 1998-2005	33

LIST OF TABLES (cont.)

Table 14:	Annual total trust revenues net of management fees--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005	34
Table 15:	Effects on timber removal volumes, prices, and revenues of varying key forecast inputs, 2001-2005	35
Table 16:	Comparison with the base-case forecast scenario of changes in timber removal volumes, prices, and revenues for pessimistic and optimistic scenarios, 2002-2005	37
Table A1:	Projected revenues by fund and fiscal year, June 2001 forecast, 2000-2005 (\$millions)	52
Table A2:	Projected revenues by fund and fiscal year, September 2001 forecast, 2000-2005 (\$millions)	53
Table A3:	Change from June 2001 to September 2001 forecast-Projected revenues by fund and fiscal year, 2000-2005 (\$millions)	54
Table A4:	Change from June 2001 to September 2001 forecast-Projected revenues by fund and fiscal year, 2000-2005 (%)	55
Table A5:	Revenue projections by fund and biennium, 1995-97 to 2003-05 (\$millions)	56

LIST OF FIGURES

	Page
Figure 1: Actual and predicted nominal stumpages for Washington state DNR and U.S. Forest Service timber sales of all species west of the Cascade Mountains, 1983-2005	15
Figure 2: Nominal revenue flows by source, 1998-2005	18
Figure 3: Actual and forecast distribution of timber removal volumes from current uncut sales under contract and new sales by year, 1998-2005	18
Figure 4: Comparison of sold timber sales volumes with timber removal volumes, 1960-2005	19
Figure 5: Purchasers' intended removals of timber from uncut timber under contract by quarter and purchaser survey date, March 1999 to December 2002	20
Figure 6: Comparison of volume of timber removed with standing timber remaining under contract, 1960-2005	23
Figure 7: Comparison of nominal prices for timber sales with nominal prices for timber removals, 1960-2005	24
Figure 8: Actual and forecast non-timber annual revenues by major source, 1995-2005	26
Figure 9: Actual and forecast estimates of annual aquatic revenues, 1993-2005	28
Figure 10: Actual and forecast estimates of annual aquatic revenues by major source, 1993-2005	29
Figure 11: Total nominal revenues from upland and aquatic land management activities--Comparison of February 2000 forecast with November 1999 forecast, 1998-2005	30
Figure 12: Distribution of nominal revenue flows, 1998-2005	30
Figure 13: Nominal revenue flows to management accounts by account, 1989-2005	32

LIST OF FIGURES (cont.)

Figure A1: Difference between target and actual values for timber sale volumes by fiscal year	47
Figure A2: Difference between forecast and actual values for timber sale prices by fiscal year	48
Figure A3: Difference between forecast and actual values for timber removal volumes by fiscal year	48
Figure A4: Difference between forecast and actual values for timber removal prices by fiscal year	49
Figure A5: Difference between forecast and actual values for timber removal revenues by fiscal year	49
Figure A6: Difference between forecast and actual values for agricultural and mineral lease revenues by fiscal year	50
Figure A7: Difference between forecast and actual values for commercial real estate lease revenues by fiscal year	50
Figure A8: Difference between forecast and actual values for aquatic revenues by fiscal year	51
Figure A9: Difference between forecast and actual values for total revenues by fiscal year	51

ECONOMIC BACKGROUND

US Economy¹

US economic growth slowed over the last year, and the nation's longest peace-time expansion has all but ended. Real (i.e., inflation-adjusted) gross domestic product (GDP) growth in the second quarter of 2001 slowed to 0.7%, down from 1.3% in the first quarter. Consensus forecasts of real GDP growth have decreased also, and presently stand at 1.7% for 2001 and 2.8% for 2002 (4.1% in 2000). These GDP growth estimates are down from January 2001 consensus estimates of 2.6% and 3.4% for 2001 and 2002 respectively (Blue Chip Economic Indicators, 2001).

In response to the slowing economy, the Federal Reserve Bank (FRB) has reduced the federal funds rate on eight successive occasions since the start of the year, by a total of 3.5%. At the time of writing, the latest reduction of 0.5% occurred on September 17, 2001, following the terrorist attacks of September 11, but further reductions seem likely in the near term. Whether the domestic economy responds to these interest rate reductions remains to be seen, but one factor ominously different about the present slowdown is its global synchronicity: the US, Japanese/Asian, and European economies are all slowing at the same time. The current slowdown is proving more protracted than originally anticipated, and the risk is that it will lengthen still further.

Real consumer spending has been a major factor mitigating the weakness observed in the manufacturing and technology sectors of the US economy so far, aided by the interest rate reductions engineered by the FRB and the recent distribution of tax refund checks. Real consumer expenditure growth of 2.9% and 3.0% is expected in 2001 and 2002 respectively, levels largely unchanged since January 2001 (4.8% in 2000; Blue Chip Economic Indicators, 2001), but how long consumers will continue to support the economy is debatable, particularly in the wake of the September 11 terrorist attacks. Following declines in the stock market and recent lay-offs, consumer confidence appeared to be softening, a trend that may be hastened somewhat by the September 11 terrorist attacks. Further deterioration in labor market conditions could also contribute to reduced consumer spending. Given the lag between FRB interest rate cuts and the effects of those cuts being felt in the economy, one wonders whether the latest interest rate cuts by the FRB were intended more to maintain consumer confidence (and therefore spending) than anything else, while waiting for previous interest cuts to make their effects apparent. However, the FRB interest rate reductions have led to reductions in mortgage interest rates, and the subsequent wave of refinancing has increased liquidity for personal consumption expenditure by both releasing home equity and reducing mortgage payments. In the longer term, corporate profitability is likely to be a key driver of consumer confidence and therefore expenditures.

The US trade deficit has expanded rapidly since 1997, but the magnitude of the deficit has stabilized somewhat in recent months as imports have declined more than exports in a slowing economy. Eventually this deficit will unwind, but Resource Information Systems, Inc. (RISI)

¹ Years in the 'Economic background' section refer to calendar years (ending December). Elsewhere and unless otherwise indicated, years refer to fiscal years (ending June).

argues that the trade gap will not shrink appreciably unless there is a severe recession in the USA or the US dollar depreciates substantially. Indeed, slowing growth in foreign economies means that demand for US exports may decline, leading to the possibility of further expansion of the US trade deficit in the near term (seasonal factors aside).

Inflationary pressures in the US economy have not eased as much as anticipated, particularly given the FRB interest rate cuts and declining energy prices. However, consumer price inflation is still anticipated to ease from 3.2% in 2001 to 2.5% in 2002 (3.4% in 2000; Blue Chip Economic Indicators, 2001), even though the effects of the FRB interest rate cuts will be feeding through into the US economy over this period.

The FRB interest rate cuts have had impacts on mortgage interest rates, and these impacts are reflected in forecasts for mortgage interest rates, though not perhaps as much as might be anticipated given the magnitude of the interest rate cuts. Clear Vision Associates (CVA) forecasts mortgage interest rates (for a 30 year fixed interest rate, 20% down payment) to decline from 8.1% in 2000 to about 7.2% in 2001 and 2002, before declining further through 2003 and 2004 to reach 6.0% in 2005. RISI predicts that, on average, mortgage rates will decline through 2001 from 7.9% in 2000 (effective conventional mortgage average of adjustable and fixed rates) to a low of 6.9% in 2002, and average 7.4% over the 2000-05 period. The Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal National Mortgage Association (Fannie Mae) were both yielding 6.62% and 6.78% on 30-year mortgages (delivered within 30 days) as of September 7, 2001 (Wall Street Journal, 2001).

Certain other risks face the U.S. economy also. These include:

- Misjudgment by the FRB of inflationary pressures in the domestic economy, and the appropriate monetary policy response. (A difficulty the FRB faces in determining the appropriate response involves assessing the impact of its interest rate manipulations, because there is a six to 18 month lag before a response can be observed. This lag creates uncertainty.)
- Delayed recovery of corporate profitability (possibly prompted by the terrorist attacks of September 11, 2001, appreciation of the US dollar, reduced productivity growth, etc.) leading to further lay-offs of employees, and denting consumer confidence to the extent that real consumption expenditures decline, and the US economy tilts into recession.

US Solid Wood Consumption

Housing starts are widely regarded as a leading economic indicator, and since they are also somewhat interest-rate sensitive, changes in interest rates resulting from FRB interventions will eventually tend to feed through into residential construction activity, i.e., the main end use for solid wood products in the USA. For the wood products industry, a beneficial effect of the FRB interest rate cuts has been that the house construction sector has exhibited considerable resilience in the face of the slowdown observed elsewhere, largely on account of declining

mortgage interest rates stimulating new housing and mortgage refinancing. However, should unemployment continue to rise and result in reduced consumer expenditures, residential house construction is likely to slow also.

The reductions in interest rates have lead to revised forecasts of housing starts. CVA forecasts housing starts to increase through 2001 and 2002 from a seasonally-adjusted rate of 1.57 million units (excluding mobile homes) in 2000 to 1.68 million units in 2003. CVA then forecasts housing starts to decline to 1.64 million units in 2004 and rise to 1.75 million units in 2005. While CVA generally anticipates an increasing trend in housing starts, their latest estimates are lower than their previous forecast on account of mortgage rates remaining higher than anticipated. Like CVA, RISI is also optimistic regarding the prospective trend in new housing starts, and now forecasts a rising trend to a peak of 1.71 million in 2004. Their latest estimates are an increase on their previous forecast estimates, reflecting not only reduced interest rates, but also upwardly revised census data and the anticipated effects of tax rebates and prospective tax cuts.

Other commentators expect housing starts to remain fairly flat for 2001 and 2002. One survey of economic forecasts anticipates new housing starts will reach 1.60 million units in 2001 and 1.58 million units in 2002 (Blue Chip Economic Indicators, 2001). Another survey (reported by CVA) projects 2001 starts of 1.58 million units, and 2002 starts of 1.57 million units. The National Association of Home Builders estimates starts at 1.57 million units for 2001, and 1.60 million starts for 2002.

On the residential upkeep front, CVA anticipates real expenditures on residential additions and alterations for 2001 to remain at about 2000 levels (\$86.1 and \$87.4 billion for 2000 and 2001 respectively, seasonally adjusted 1996\$), before rising through 2002 to reach nearly \$94 billion in 2003. RISI forecasts real repair and remodeling (R & R) expenditures to decline from about \$131 billion (seasonally adjusted 1996\$) in 2000 to \$121 billion in 2001, before rising through 2002 and 2003 to a peak of over \$137 billion in 2004.

Interaction Between the U.S. and Selected Foreign Economies

Forest products are internationally traded commodities, and although sawtimber purchased from land managed by the Washington State Department of Natural Resources (DNR) by law cannot be exported in unprocessed form, the department still faces impacts indirectly related to economic and market conditions in foreign countries. The department experiences these impacts primarily as consequences of the responses of firms in

Japan has been the major market for North American exports of softwood logs, lumber, and wood chips.



the U.S. forest and wood products sectors that are directly exposed to these conditions. The department also experiences impacts related to trade policies governing trade in forest products.

Japan and Canada are the main foreign countries influencing the U.S. forest products economy. In general, Japan is the major export market for U.S. (and North American) forest products, particularly logs and lumber. Canadian firms are the major competitors faced by US forest products firms, both in the domestic U.S. market and in the Japanese export market, and especially in the lumber markets in both countries.

- **Japan**

The beleaguered Japanese economy is staggering yet again, and hovers close to recession. An expectation of prolonged stagnation persists among economic commentators, even though a newly elected prime minister attained the office on policies that included (long overdue) structural economic reform. Furthermore, slowing economic activity elsewhere in Asia, the USA, and Europe suggests that the Japanese export sector will provide little relief to the economy in general (as it has in the recent past).

These conditions are reflected in real GDP growth forecasts. Results from an August 2001 survey indicated consensus estimates of real GDP growth in Japan for 2001 and 2002 were 0.0% and 1.0% respectively (Blue Chip Economic Indicators; 2001). Real GDP growth rates were 0.8%, and 1.5% in 1999 and 2000 respectively. From these levels, RISI expects 0.0% real GDP growth in 2001, picking up to about 1.2% in 2002 and 2003 to reach 2.0% in 2004. CVA shares a similar view of the Japanese economy, estimating zero real GDP growth in 2001, with GDP growth then increasing to 1.3% in 2002 and 1.5% in 2003 and 2004.

Forecasts of lackluster near-term GDP growth are also reflected in forecasts of Japanese housing starts. Both CVA and RISI forecast declines in housing starts for 2001 to 1.17 million units and 1.21 million units respectively (1.23 million units in 2000). CVA then forecasts housing starts to rise to 1.23 million units in 2002, before a declining slightly to a plateau of about 1.21 million units for 2003-05. RISI forecasts housing starts will remain at 2001 levels in 2002 (i.e., 1.21 million units), before rising through 2003 to a level of 1.29 million units in 2004. A consensus position reported by CVA is for housing starts to reach 1.19 million units in 2001 and 2002.

- **Canada**

Trade policy can give rise to unintended consequences and the recently imposed 19.31% penalty tariff on softwood lumber exported from Canada into the USA is no exception. The penalty tariff (and any subsequently assessed duties) imposed by the US Department of Commerce may, in the short term, increase softwood lumber prices in the US. However, to what extent--and even whether--DNR and other sawtimber growers will benefit from reimposition of this tariff is obscure. DNR might be expected

to share in the lumber price increase through the purchaser bidding process, but the duty also makes it hard for Canadian firms to export lumber to the US market, particularly while the Japanese market remains in the doldrums. These circumstances could then make it easier for the Canadian firms to make the case for exporting logs under the Canadian log export regulatory regime, and these logs may then become potentially available for purchase by Washington and Oregon firms. (Refer to the June 2001 forecast for a discussion of increased exports of Canadian softwood logs in the context of the SLA; Glass, 2001.) As the potential availability of these Canadian logs increases, then Washington and Oregon bidder interest in DNR sales may well diminish, and the timber sales prices the department receives may decline on account of the reduced bidder competition.

Imposing this 19.31% penalty tariff is the first stage of a dispute resolution procedure. Subsequent stages in the procedure will assess the validity of the complaint(s) giving rise to the penalty tariff, and the tariff may be adjusted according to any assessed damages, or removed entirely. It will likely take a considerable time to settle this latest chapter in the controversy regarding imports of softwood lumber from Canada and price discovery mechanisms for Canadian timber.

MARKET OUTLOOKS

Softwood Sawtimber Supply²

Washington State Department of Natural Resources is a major seller of standing timber in the western USA. Prices received for timber sold by the department depend in part upon harvest levels and standing timber inventories within both this western US region (and especially in the Pacific Northwest), and other major North American softwood producing areas, principally British Columbia (BC) in Canada, and the US South.

Softwood sawtimber harvest in the western USA has declined markedly from a peak of 24.5 billion board feet (bbf, International ¼-Inch scale³) in 1987 to 12.4 bbf in 2000. This decline is largely attributable to reduced timber harvests from public (National Forest) and private lands, stemming from government policies, listing of species under the Endangered Species Act (ESA) and, to a lesser extent, the age class distribution of the resource (especially on private land). RISI forecasts a continuing decline in total sawtimber harvest in the western U.S.A. to 11.7 bbf in 2005. CVA predicts softwood sawtimber harvests in Washington to be fairly flat over the 2001-05 period, averaging about 4.0 bbf/year (Scribner log rule; 4.0 bbf in 2000). CVA expects harvests in Oregon also to remain flat over this same period, averaging about 3.4 bbf/year (Scribner log rule). An increasing proportion of the softwood sawtimber harvest in the western US is likely to be sourced from private lands. According to RISI, the share of the softwood harvest from private land in the western US region has increased from about 48% in 1987 to over 80% in 2000, and is expected to reach nearly 90% by 2005.

With the transition from the Clinton administration to the Bush administration, significant changes are starting to appear in US federal timber policy that have implications for (public) timber supply. The roadless area policy established under the Clinton administration is now likely to be modified in ways that facilitate timber production. Also, the Bush administration also appears to be more predisposed than the Clinton administration to establishing thinning programs for maintaining forest health and for fire suppression purposes--changes in this direction will increase the supply of small diameter logs in particular. Offsetting these factors that could potentially contribute to an expanding timber supply in the western US are impacts associated with listings of salmon under the Endangered Species Act (ESA), increased regulation by government agencies, and continued pressure from environmental groups.

British Columbia (BC) accounts for a large proportion of Canada's total timber production, about 43% according to RISI. RISI estimates BC sawtimber harvest will decline from an average of about 16.8 bbf/year over the 1991-95 period to 15.4 bbf/year from 2001-05, with further reductions likely beyond 2005. These harvest reductions are likely to be understated on account of some recent habitat reservation measures implemented in coastal BC. The harvest reduction will be experienced mainly on public lands (source of the bulk of BC timber harvest), and reflects environmental and regulatory pressures similar to those facing the

² Sawtimber refers to tree or logs of sufficient size (generally greater than 4 inches inside-bark diameter) and quality that allows them to be processed into lumber.

³ Unless otherwise stated, sawtimber volume in this section is expressed in terms of this log rule. Elsewhere in the report, the Scribner log rule is used.

western US resource. The reduction is also expected as a consequence of increasing competition in a soft Japanese lumber market eroding Canada's position as a supplier. (However, increased log exports from Canada to both the USA and Japan are expected to mitigate harvest reductions somewhat, at least as long as Japanese market conditions remain depressed and trade policy restricts softwood lumber access to the USA; see pages 4 and 5.) CVA also foresees a fairly flat harvest over the 2001-05 period, averaging about 14.1 bbf/year (Scribner log rule; 14.3 bbf in 2000).

Softwood timber harvest in the southern USA has declined from a peak of 18.7 bbf in 1988 to 14.5 bbf in 2000. RISI predicts timber harvest in the US South will decline further to 13.0 bbf by 2005. RISI ascribes this decline to the underlying age-class distribution of the southern timber resource rather than changes in national timber policy and/or increasing environmental regulation (although environmental regulation is emerging as a potential factor that may also limit southern timber supply).

From DNR's perspective, this softwood sawtimber supply outlook is less favorable than it has been, primarily because depressed softwood lumber market conditions in Japan and trade restrictions on softwood lumber exports to the USA will tend to make Canadian softwood logs more readily available to sawtimber purchasers in Washington and Oregon who might otherwise have been more inclined to purchase sawtimber from DNR-managed lands. Counteracting this downward pressure are the age-class distribution of DNR-managed forest (i.e., heavily weighted toward older stands; Bolsinger *et al.*, 1997), flat to declining harvests in BC, a reduction in the harvestable inventory in the southern USA, and regulatory restrictions on timber harvesting activities on both public and private lands. Which effect(s) will prevail is a matter of some speculation at this stage and, of course, end-use demand conditions will also play a role.

Softwood Sawtimber Demand

Sawtimber demand is primarily expressed as a demand from mills for log inputs, either as logs or standing timber. However, demand for sawtimber is really a derived demand, being driven by demand for the main products derived from sawtimber, i.e., export logs, lumber, plywood, and wood chips.

- **Lumber**

A steadily rising trend can be observed underlying cyclical fluctuations in total US softwood lumber consumption data spanning the 1976-2000 period. Over the forecast period however, both RISI and CVA regard total softwood lumber consumption as declining from a cyclical peak in 1999 (54.7 bbf). RISI



forecasts consumption to steadily decline from this peak to a low of 50.4 bbf in 2002 (53.4 bbf and 50.5 bbf in 2000 and 2001 respectively), before increasing through 2003 to a cyclical peak of 57.6 bbf in 2004. CVA views consumption as increasing through 2002 from 53.6 bbf in 2001 to a cyclical peak of 57.3 bbf in 2003.

New residential housing remains the largest end-use for softwood lumber in the USA. In 2000, new housing (including mobile homes) consumed 22.0 bbf of lumber (over 41% of total consumption), compared with 15.7 bbf for R & R (29%). RISI forecasts softwood lumber consumption in both new housing and R & R uses as declining from 2000 levels (38 bbf) to a low of 35 bbf before increasing through 2002 and 2003 to reach a cyclical peak of over 41 bbf in 2004. Of particular note here is that the proportion of lumber used for R & R purposes is increasing more rapidly than the proportion of lumber used in new housing, however RISI no longer anticipates the volume of lumber consumed for R & R purposes will exceed that used in new housing during the 2001-05 forecast period.⁴ CVA estimates US softwood lumber consumption for residential construction will total 36.9 bbf in 2001 and 38.2 bbf in 2002 (split 58% new homes and 42% repair and remodeling for each year).

The other main end uses for softwood lumber in the US are nonresidential construction and industrial production (e.g., furniture production, pallets and crates, etc.). According to RISI, in 2000 about 2.5 bbf and 13.3 bbf of softwood lumber was consumed in each of these two end uses respectively. RISI estimates softwood consumption for nonresidential construction will increase from a low of 2.4 bbf in 2001 and 2002 through 2003-04 to reach 2.8 bbf in 2005, while industrial softwood lumber use will increase from a low of about 13.0 bbf in 2001 and 2002 through 2003-04 to reach 13.7 bbf in 2005. CVA forecasts nonresidential consumption of softwood lumber to total 16.7 bbf in 2001 and 16.9 bbf in 2002.

- **Structural Panels**

Structural panels include plywood and oriented strand board (OSB). Plywood is manufactured from sawtimber-sized logs, whereas OSB is manufactured from (flaked) wood chips and does not require as high a quality log input as does plywood manufacture. In terms of end-use, OSB is being used more and more in many of plywood's traditional uses in residential construction, and in other uses at the expense of solid wood (e.g., use of I-beams for structural purposes). Because Washington state is a major source of Douglas fir plywood (much of it manufactured from the relatively high quality, large logs sourced from DNR-managed lands), and there is little OSB production capacity in the Pacific Northwest (which could otherwise provide a market outlet for timber from DNR-managed lands), replacement of plywood by OSB in the structural panels market is likely to negatively impact the department's timber sales

⁴ In previous forecasts, RISI have forecast that softwood lumber consumption for R & R would exceed that used for residential construction during the forecast period. Revisions to underlying end-use factors now mean that softwood lumber consumption for R & R is no longer forecast to exceed that used for residential construction during the forecast period.

revenues. Specifically, the release of log volume from plywood production is and will continue to be (for reasons outlined below) a source of downward pressure on timber sales (and lumber) prices.

In its June 2001 forecast, CVA estimates (apparent) US consumption of structural panels will decrease from a 2000 level of about 37 billion square feet (bsf, 3/8-inch thickness basis) to 36 bsf in 2001, before increasing to nearly 43 bsf in 2005. RISI foresees a similar growth trend, predicting consumption to increase from about 40 bsf in 2001 to about 45 bsf in 2004 and 2005. OSB imported from Canada is expected to supply an increasing proportion of U.S. structural panel consumption over the forecast period, growing from a share of nearly 23% in 2001 to over 25% in 2005 according to CVA (21% in 2000; over 20% in 2001 to over 26% in 2005 according to RISI).

Competition for market share in the structural panels market remains intense, as plywood manufacturers struggle to maintain market share in the face of expanding low production cost OSB capacity. Further OSB capacity expansion is anticipated in North America over the forecast period, but in the near term the American Plywood Association reports that planned OSB capacity expansions have been postponed from 2001 and 2002 to 2003. This postponement of capacity expansion appears to be reflected in both CVA and RISI forecasts. Nevertheless, ongoing substitution of plywood by OSB, particularly in residential construction applications, will reduce plywood market share from 47% in 2000 (17.5 bsf) to 37% in 2005 according to CVA (49% in 2000 to 35% in 2005, according to RISI). This substitution process will likely release logs for lumber production that might otherwise be utilized for plywood production. Given the likelihood that excess mill capacity in the US South will be chasing a diminishing raw material supply, plywood producers in the western USA may fare better in this capacity adjustment process than their southern counterparts, but they are still likely to remain higher cost producers than southern plywood manufacturers primarily on account of the wood-cost differential.

- **Engineered Wood Products**

Engineered wood products (EWP) are gaining an increasingly large foothold in markets dominated by softwood lumber. The inherent advantages of these products are performance and cost. Their performance advantage arises because EWPs tend to have less variability compared to solid wood, imparting performance consistency, reducing design margins, and opening up new applications (e.g., wider spans). The cost advantage of these products ultimately lies in their manufacture from a lower cost raw material



feedstock compared with solid lumber, and their ease of installation. In short, EWPs are proving an efficient use of wood in many applications.

Outside the structural panels market, the main EWPs are the wooden I-beam, and laminated veneer lumber (LVL). Wooden I-beams take their name from their cross-section: it looks like a capital 'I', with a central vertical (termed 'web') component often made of OSB, and upper and lower flanges manufactured of solid wood or, increasingly, LVL. Like plywood, LVL is manufactured from veneer, but the veneer is laminated in the form of a solid wood member, rather than as a panel. Of these two types of EWPs, substitution away from solid wood towards I-beams is likely to have the greatest impact on the department.

According to RISI, demand for I-beams is likely to slow over the 2000-02 period, but will then increase steadily through to the end of the forecast period, with growth over the entire 2000-05 period averaging some 3.9% per year (0.5%/year for LVL). Usage rates for EWP are expected to increase over the forecast period also (i.e., quantity used per unit construction), reflecting ongoing substitution for solid wood members. Excess capacity in the North American I-beam and LVL industry is expected to be a major factor driving substitution away from solid wood to EWPs, despite anticipated demand improvement.

One factor underpinning the longer term trend toward increased use of I-beams is a steadily diminishing supply of the large logs that have traditionally provided large dimension solid wood products. Future volumes of large-diameter logs produced from DNR-managed lands will determine the department's exposure to the competition in end-use markets between solid wood members and I-beams, and therefore influence prices received for sawtimber sales.

- **Wood Chips**

Wood chips are used mainly in manufacturing wood panels (both structural and nonstructural), and pulp and paper products. Wood chips are obtained from two major sources: (a) as a by-product of lumber and plywood manufacturing; and (b) directly from pulpwood (roundwood). Chips sourced from pulpwood are a relatively small component of raw materials demand in the western USA, and softwood manufacturing residues provide the bulk of the chip supply. Since reconstituted



Barging is a commonly used means of transporting wood chips produced from lumber and plywood mill residues to pulp and paper mills in western Washington.

panel mill capacity in the western USA is relatively low, most of these chips are either supplied to pulp mills in the region or exported.

The amount of chips available as a by-product of lumber and plywood manufacturing depends upon mill capacity, production levels, and conversion efficiencies. In the western USA, both CVA and RISI forecast only a slight increase in residue availability over the forecast period, as increased residues from increased lumber production are largely offset by residue reductions from improvements in conversion efficiencies and reduced plywood production. Roundwood pulpwood production in the western USA is also expected to increase (RISI) or decline (CVA) slightly over the 2001-2005 period. RISI continues to warn that demand for roundwood pulpwood in the region could be less than anticipated, suggesting instead that pulp producers would be more likely to bid wood chips out of the export market to meet their needs rather than utilize pulpwood.

Pulp and paper markets are weakening in concert with a slowing US (and global) economy, and mills are curtailing production, thereby reducing demand for wood chips. This declining demand is also reflected in forecasts of wood chip prices, a price trend reinforced by forecasts of increased lumber production in the western region over a similar time frame. From 2000 levels (\$89/bone-dry unit, or bdu, in Oregon and Washington), CVA forecasts softwood chip prices will decline through 2001, 2002, and 2003 to reach a low of \$67/bdu in 2004. RISI forecasts softwood chip prices will remain flat at about \$83/oven-dry ton (odt) until 2002, and then increase through 2003 to an average of about \$100/odt in 2004 and 2005. According to RISI, part of the anticipated price trend for softwood chips in the western USA is also attributable to non-cyclical factors, i.e., structural change occurring in the Japanese pulp and paper industry as Japanese pulp producers diversify their supply sources away from western US chip producers.

It is most unlikely that softwood chip prices will recover to levels of the mid-1990s within the foreseeable future. For DNR, the transitory nature of regional pulpwood markets highlights the uncertainty associated with relying on smallwood commercial thinning for pulpwood production to achieve both silvicultural and revenue objectives.

Softwood Sawtimber Stumpage

RISI and CVA forecast somewhat different stumpage trends. RISI forecasts western sawtimber stumpage (and log prices) to decline from 2000 levels through 2001 to a cyclical low in 2002, before increasing through 2003 to a plateau in 2004 and 2005. CVA anticipates DNR stumpage in also decline from 2000 levels in 2001, before rising strongly through 2002 to a peak in 2003. CVA then forecasts DNR stumpage to decline in 2004 before rising again in 2005. Both RISI and CVA stumpage price projections reflect their respective forecasts of construction activity. In effect, softwood stumpages appear to be re-establishing themselves at about late 1980 and early 1990 levels (in real terms).

In the longer term, there are three major structural factors at work on the demand side of the forest products economy.⁵ These factors include:

- Relatively high demand for housing, driven by the proportion of the population in the household forming years;
- Substitution away from solid wood products, in favor of EWP and non-wood products (discussed in a previous section); and
- Increased competition from other suppliers of logs, lumber, and other wood products in both domestic and export markets, and substitution away from US-sourced products.

On the supply side of the US forest products economy, the productive base in the western USA is likely to remain under pressure even though thinning programs on national forest lands look a likely prospect given the recent change in administration. Conversion of forestland to other land uses will also contribute to a diminishing timber supply base, as is occurring in the Pacific Northwest (for example, see Azuma *et al.*, 1999).

As noted previously (see pages 4 & 5), log imports from Canada have also increased in the past two to three years, a change made possible by the dual conditions of softwood lumber trade restrictions imposed on exports of softwood lumber from Canada into the USA and adverse export market conditions for Canadian softwood lumber outside of the USA. These Canadian log imports may be having an underappreciated depressing impact on local log prices in western Oregon and western Washington (especially at the whitewood end of the market), thereby offsetting the upward price pressure that might normally be associated with a shrinking supply base and an optimistic construction outlook. To the extent that Canadian log imports actually depress log prices, returns to the timber grower likely will diminish accordingly. There is no reason to think DNR will be immune to these pressures.

⁵ Further details regarding these long-term trends are available in the November 1998 forecast (Glass, 1998).

OVERVIEW AND KEY ASSUMPTIONS OF FORECAST

Overview

Revenues are forecast for management activities carried out by DNR on state-owned lands managed by the department for various trust beneficiaries (Table 1). Two administrative divisions of DNR are responsible for generating revenues from managing these trust lands: Product Sales and Leasing, and Aquatic Resources.

Table 1: Uplands and aquatic lands managed by the Washington State Department of Natural Resources

Uplands	Aquatic lands
Forest Board transfer lands	Beds of navigable waters
Forest Board purchase lands	First class tidelands and shorelands
Common school, indemnity and escheat grants	Second class tidelands and shorelands
Agricultural school grant (Washington State University)	Harbor areas
Scientific school grant (Washington State University)	
University grant--Original and transferred (University of Washington)	
Charitable, educational, penal, and reformatory institutions grant	
Normal school grant (Eastern, Central, and Western Washington Universities, and The Evergreen State College)	
Capitol building grant	
Community and technical college forest reserve	

Forecasting is carried out at a high level of aggregation. Overall revenue flows are allocated to the various trust beneficiaries and their associated management funds according to: (1) the trust lands from which they are derived; and (2) legislative mandates.

This forecast does not estimate revenues from all sources. For timberland, only revenues from timber sales and special forest products are estimated. Revenues from timber sales-related activities, forest road assessments, nursery seedling sales, and miscellaneous timber revenues are not forecast. Other revenues that are not forecast include income from land sales, interest income, and fees, penalties, and other miscellaneous revenue.

Key Assumptions

This section focuses on the major assumptions used in projecting total revenues from timber land management activities on trust lands. Key assumptions include projected timber sales volumes and prices, and the removal rate of timber from both uncut timber under contract and new sales. The effects of changes in these key assumptions are tested in a sensitivity analysis (see page 35).

1. Timber Sales Volume

The timber sales estimates used in the forecast (Table 2) are sourced from the Product Sales and Leasing Division (PSLD). Where possible, PSLD staff derive timber sales estimates from the department's action plans. The forecast assumes target (sold) timber sales levels of about 560 mmbf per year for the years beyond those spanned by the action plans, i.e., FY 2003 and beyond. While these target sales levels represent the department's best interim estimate of what will actually be sold (considering recent timber sales levels, and various harvest and operational restrictions), they are subject to considerable uncertainty in practice. The estimates are compiled under certain assumptions (listed below) that may prove too optimistic in reality. In particular, pending recalculation of the sustainable harvest, sales levels for FY 2003 and beyond should be regarded as provisional, and subject to potentially substantial revision. (Initial results of the recalculation will be available for approval by the Board of Natural Resources by July 2002; refer to the November 1999 forecast for further details; Glass, 1999).

Table 2: Annual sold timber sales volumes--Comparison of September 2001 forecast with June 2001 forecast, 1998-2005

Fiscal year ending June	June 2001 forecast (mmbf)	September 2001 forecast (mmbf)	Change (mmbf)	Change (%)
1998	572 ¹	572 ¹	0	0.0
1999	567 ¹	567 ¹	0	0.0
2000	503 ¹	503 ¹	0	0.0
2001	440 ²	460 ³	20	4.7
2002	525 ²	480 ²	-45	-8.6
2003	560 ^{2, 4}	581 ^{2, 4}	20	3.6
2004	558 ^{2, 4}	558 ^{2, 4}	0	0.0
2005	557 ^{2, 4}	557 ^{2, 4}	0	0.0

Notes:

1. Actual values.
2. Predicted values.
3. Preliminary value.
4. Estimates for FY 2003 & beyond are provisional, pending recalculation of the sustainable harvest.

The main assumptions underlying the estimates presented in Table 2 are:

- Meeting offered sales levels is operationally feasible.
- Sufficient resources are available to achieve the offered sales levels.
- Offered sales levels are not constrained by new regulations or non-timber management objectives.

Compared with the June 2001 forecast, actual (preliminary) sold timber sales volumes were 20 mmbf higher than anticipated for FY 2000 (Table 2). However, target sold timber sale volumes for FY 2002 are 45 mmbf lower compared with the June 2001 forecast and 20 mmbf higher for FY 2003, a net biennial reduction of 25 mmbf (some 2%). This forecast assumes no change in sold timber sales levels for FY 2004 and FY 2005.

2. Timber Sales Prices

For the most part, DNR sells sawtimber for lumber and plywood production, i.e., standing timber for harvest during a specified time frame. The principal sawtimber species are the softwoods Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*).

'Stumpage' refers to the price of standing timber, and DNR stumpage is generally higher than the U.S. Forest Service Westside All Species softwood sawtimber bid stumpage (Figure 1). This price differential reflects quality differences and, to perhaps a lesser extent, factors such as differences in location, access, topography, and contract terms.

DNR sales are assumed to comprise a mix of sales and product types similar to that produced in past years. Substantial price differentials exist between product types offered for sale by the department. Likewise, price differentials occur from species to species within specific product types. The sales price forecasts take such qualitative differentials into account to the degree that these differences are reflected in the product mix sold by the department prior to June 30, 2001.

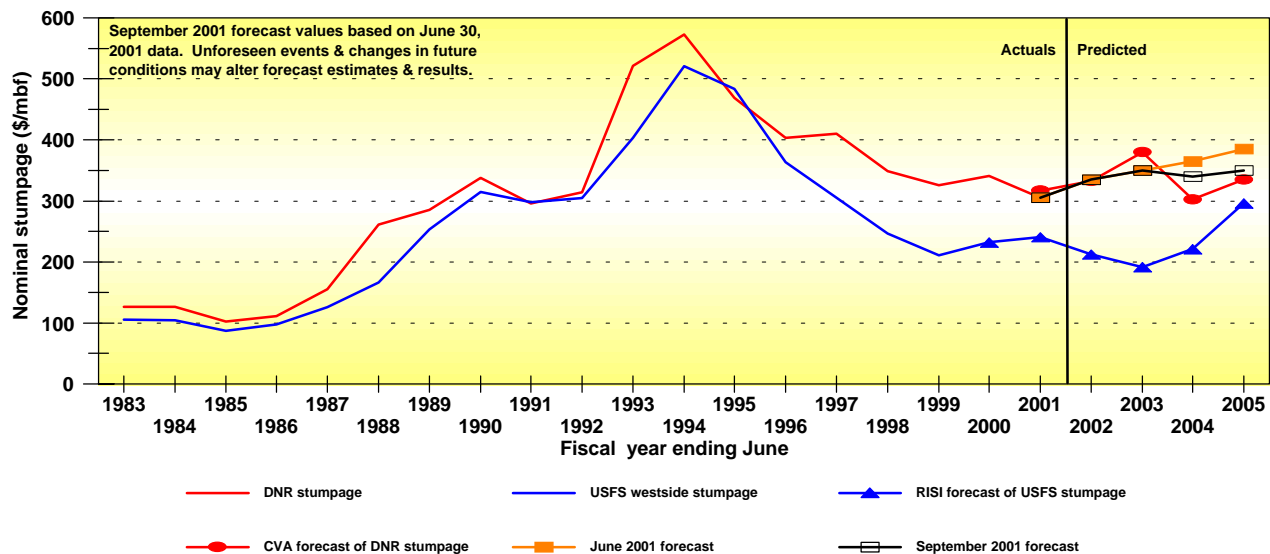
Table 3: Annual timber sales prices--Comparison of September 2001
with June 2001 forecast, 1998-2005

Fiscal year ending June	June 2001 forecast (\$/mbf)	September 2001 forecast (\$/mbf)	Change (\$/mbf)	Change (%)
1998	349 ¹	349 ¹	0	0.0
1999	326 ¹	326 ¹	0	0.0
2000	341 ¹	341 ¹	0	0.0
2001	310 ²	305 ³	-5	-1.5
2002	335 ²	335 ²	0	0.0
2003	350 ²	350 ²	0	0.0
2004	365 ²	340 ²	-25	-6.8
2005	385 ²	350 ²	-35	-9.1

Notes:

1. Actual values.
2. Predicted values.
3. Preliminary value.

Figure 1: Actual and predicted nominal stumpages for Washington state DNR and U.S. Forest Service timber sales of all species west of the Cascade Mountains, 1983-2005



Note: FY 2001 estimates are preliminary

DNR stumpage is forecast to rise through FY 2002 from a cyclical low of \$305/mbf in FY 2001 (provisional estimate), to about \$340-\$350/mbf in the FY 2003-05 period (Figure 1)⁶, reflecting at least in part the impacts of recent FRB interest rate cuts on the US economy in general, and residential construction in particular. For this September 2001 forecast, estimates of sales prices for FY 2004 and FY 2005 have been reduced (Table 3), in line with RISI and CVA forecast estimates.

As noted previously (see page 5), the SLA governing exports of softwood lumber from Canada into the USA expired on April 1, 2001, and was not renewed. Since then, the US Department of Commerce has imposed a 19.3% penalty tariff on softwood lumber imported from Canada. The impact of this tariff has not been directly factored into these stumpage forecasts.

3. Timber Removals From New Sales

Total timber removal volumes consist of two portions: removals from uncut timber currently under contract, and removals from new sales, i.e., planned timber sales that have not yet been sold. A purchaser survey is used to estimate intended removals from uncut timber under contract (survey results are reported on page 21). However, since new sales have not yet been sold, it is impossible for purchasers to indicate the volume and timing of intended removals from these as yet unsold sales.

⁶ These price trends differ from those discussed on page 11, because the above trends are based on fiscal years ending June, while those on page 11 are based on calendar years ending December.

Two approaches are used to circumvent this difficulty. In the near term (i.e., two to three years out), total timber removal volumes are estimated using statistical methods that take into account factors such as sales volumes, housing starts, prices of substitute products, etc. Removals from new (future) sales are then calculated by deducting harvesters' collective removal intentions, obtained from a purchaser survey. Beyond this two to three year time horizon, a profile of timber removals from new sales over time is used to project removals from new timber sales. The profile is based on the distribution of sales contract lengths over the preceding 24 months, and assumes:

- The distribution of the lengths of new sales over the forecast period will be the same as the distribution of sales lengths over the last 24 months.
- Purchasers will harvest sales during the last year of sale contracts.⁷

Taken together, these assumptions effectively mean the data presented in Table 4 (i.e., the distribution by value of timber sales by sale length in years) may be interpreted as the average proportions of individual sale volume removed in consecutive years of the sale. Actual revenues are received upon removal of timber, rather than at the time of the sale.

Table 4: Per cent distributions, by value, of timber removals from new sales:
Comparison of current forecast with previous forecast

Year of sale	First	Second	Third	Fourth	Fifth
Current forecast	8%	39%	43%	11%	0%
Previous forecast	10%	40%	41%	8%	0%

Note: Totals may not add to 100% due to rounding.

⁷ The validity of this assumption depends upon the length of the sale contract, since the probability of removals occurring prior to the last year of a sale tends to increase with increases in sale contract duration (all other things being equal).

REVENUE FLOWS BY SOURCE

Overview

Timber sales are the major source of revenue from DNR-managed lands (Table 5 below, Figure 2 opposite). For forecasting purposes, all of these revenues are assumed received upon removal of the timber. Non-timber revenues generally account for less than 20% of total revenues (i.e., excluding trust land transfer revenues). Consistent with past years, revenues from non-timber upland management activities are projected to remain higher than those from aquatic land management activities.

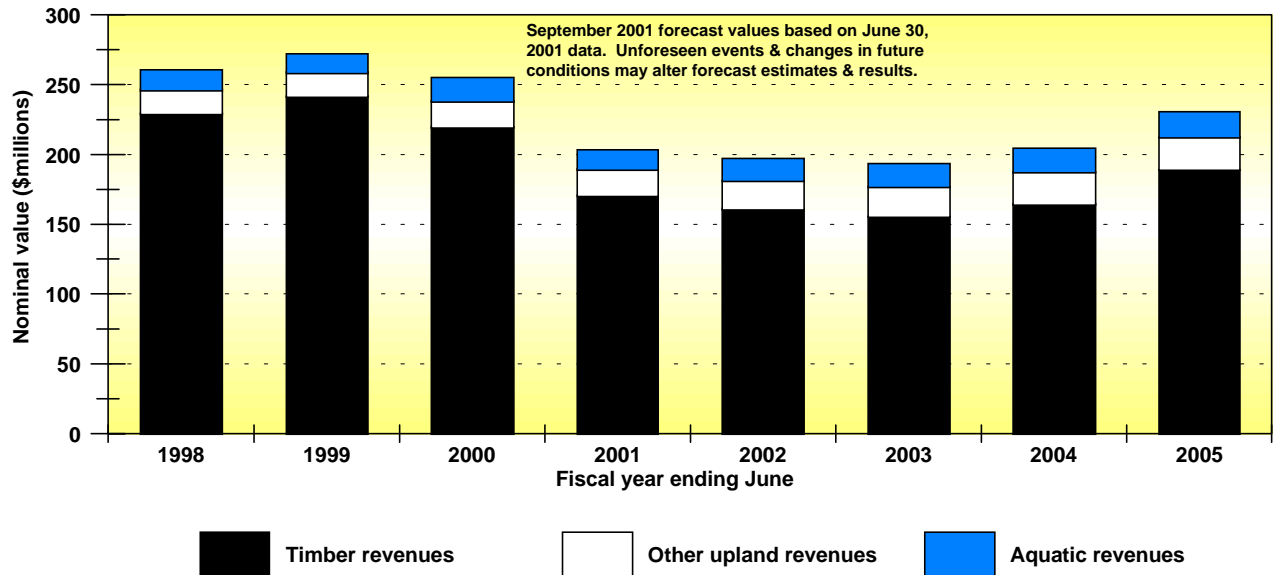
Table 5: Annual revenue flows (cash basis) by source, 1998-2005¹

Fiscal year ending June	Timber removal revenue (\$millions)	Other upland revenue (\$millions)		Aquatic revenue (\$millions)	Total revenue (\$millions) ²	Trust land transfers (\$millions) ²
		Agriculture & mineral	Commercial real estate			
1998 ³	229.4	12.8	4.5	13.8	257.7	2.1
1999 ³	241.8	12.5	5.1	12.8	271.9	19.7
2000 ³	219.9	12.4	6.1	13.0	255.3	24.7
2001 ⁴	170.6	13.5	5.7	13.6	202.8	31.4
2002 ⁵	161.2	13.4	7.0	15.8	197.4	25.0
2003 ⁵	155.5	14.2	7.2	16.5	193.4	15.0
2004 ⁵	164.8	15.2	7.4	17.1	204.6	0.0
2005 ⁵	189.2	16.1	7.6	17.7	230.6	0.0

Notes:

1. Excludes revenues from interest, trespass, land sales, timber sales-related activities, forest road assessments, nursery seedling sales, etc.
2. Totals may not add due to rounding, and exclusion of non-trust activities carried out by DNR over and above its trust land management mandate. Totals also exclude trust land transfer payments, specifically payments of approximately \$21.8 million in FY 1998-99, \$56.06 million (preliminary) in FY 00-01, and \$40 million (estimate) in FY 02-03, payable to the Common School Construction fund.
3. FY 1998 through FY 2000 data are actual values.
4. Data for FY 2001 are preliminary values.
5. Data for FY 2002 and subsequent years are predicted values.

Figure 2: Nominal revenue flows by source, 1998-2005



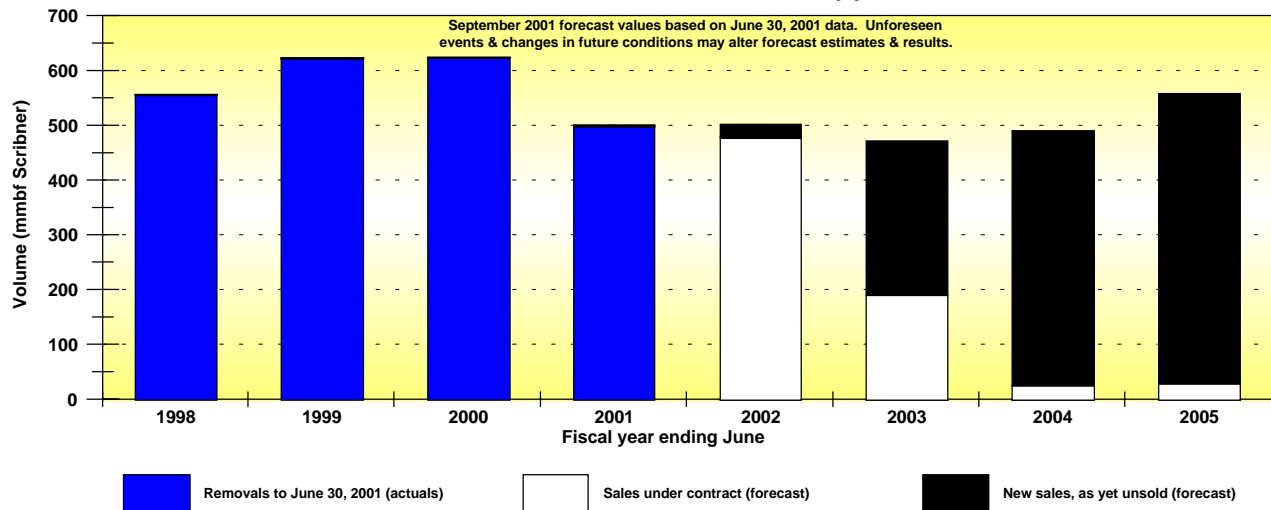
Notes: Excludes revenues from Trust Land Transfer activities; FY 2001 estimates are preliminary; Estimates for FY 2002 and beyond are forecasts

1. Timber Land Management

a. Timber Removal Volumes

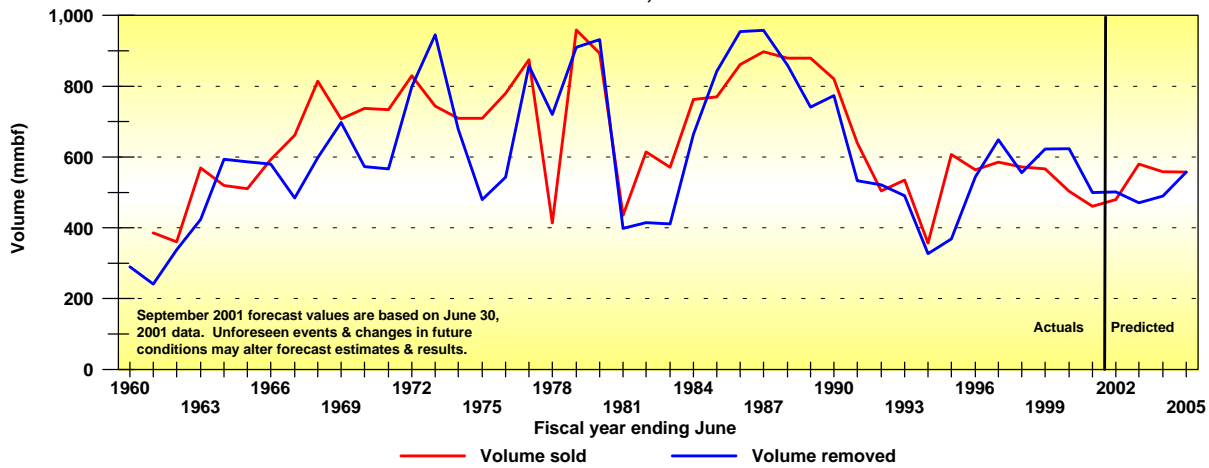
The pattern of removals anticipated from uncut sales under contract and new sales is illustrated in Figure 3. Timber removal volumes reached 500 mmbf in FY 2001 (Figure 4 overleaf), and total removals over the entire FY 2000-2005 forecast period were about 50 mmbf higher for the September 2001 forecast compared with the June 2001 forecast (3,143 bbf *versus* 3,093 bbf; Table 6), in part because of an anticipated increase in purchaser removals in FY 2002 as they respond to the stimulative effects of FRB monetary policy on construction activity, and in part because of increased estimates of future residential construction activity.

Figure 3: Actual and forecast distribution of timber removal volumes from uncut sales under contract and new sales by year, 1998-2005



Notes: Removal volumes from new sales are based on the following proportions: 8% in year 1, 39% in year 2, 43% in year 3, 11% in year 4, and 0% in year 5; FY 2001 estimates are preliminary

Figure 4: Comparison of sold timber sales volumes with timber removals volumes, 1960-2005



Note: FY 2001 estimates are preliminary

Table 6: Annual removal volumes--Comparison of September 2001 forecast with June 2001 forecast volumes, 1998-2005

Fiscal year ending June	June 2001 forecast (mmbf)	September 2001 forecast (mmbf)	Change (mmbf) ¹	Change (%)
1998	556 ²	556 ²	0	0.0
1999	623 ²	623 ²	0	0.0
2000	624 ²	624 ²	0	0.0
2001	511 ³	500 ⁴	-11	-2.2
2002	491 ³	502 ³	11	2.2
2003	450 ³	471 ³	20	4.5
2004	474 ³	490 ³	16	3.4
2005	544 ³	557 ³	14	2.5
2000-05 ¹	3,093	3,143	50	1.6

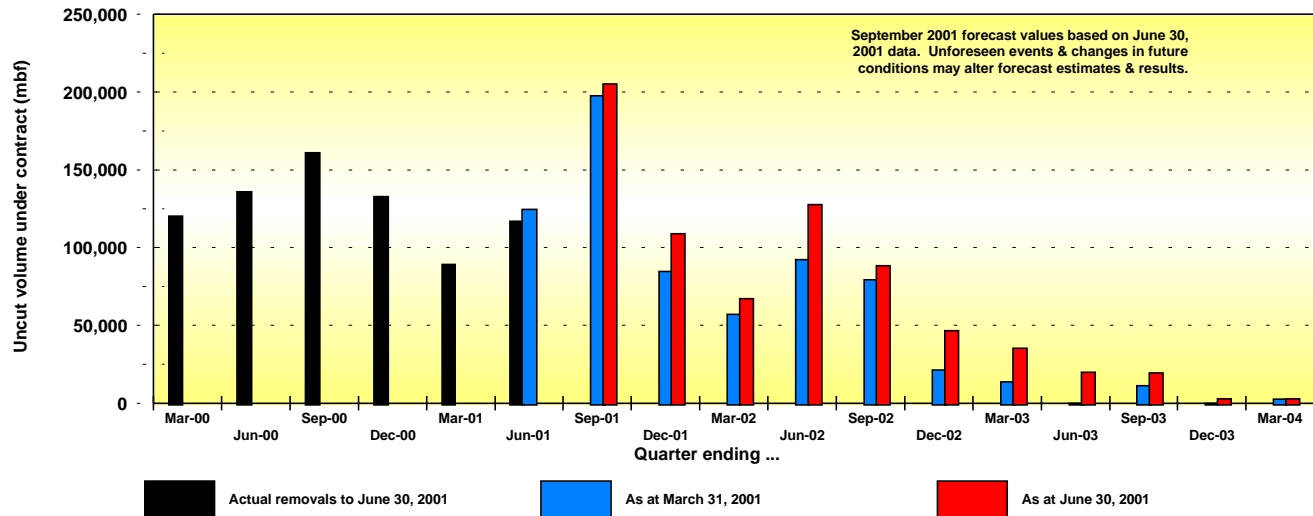
Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Removals in FY 2002 are estimated to be about the same as for FY 2001 (Table 6). Removal volumes are then forecast to decrease to 471 mmbf in FY 2003, before increasing through FY 2004 to reach some 557 mmbf in FY 2005. While this trough reflects end-use factors likely to govern wood consumption over the forecast period (see 'Market Outlooks' section), it is also in part an artifact of the forecasting methods (the methods incorporate lagged sales variables, so some of the decline results from the effects of reduced timber sales volumes of FY 2000 through FY 2002 feeding through into reduced estimates of removals; see Table 2 for sales volumes).

Actual removals for the June quarter (April, May, and June, 2001) were in line with intentions expressed in the purchaser survey carried out for the June 2001 forecast (Figure 5). Compared with the previous survey and after adjusting for new sales over the June 2001 quarter, purchasers have collectively indicated an intention to increase removals over the next two logging seasons. This pattern is consistent with predicted end-use trends (see 'Market Outlooks' section).

Figure 5: Purchasers' intended removals of timber from uncut timber under contract by quarter and purchaser survey date, March 2000 to March 2004



From time-to-time, some survey respondents express quite legitimate reservations regarding the reliability of the removal data they provide. These respondents base their comments on their practical experience with how rapidly market conditions--and their responses to those conditions--can change. However, regular and detailed examination of responses to the survey of purchasers' harvest intentions (both at the individual company level and in aggregate) indicates responses obtained are generally consistent with prevailing market conditions. Despite these legitimate concerns, the purchaser survey remains the best predictive tool presently available for estimating near-term timber removals and, in fact, has provided quite reliable estimates of removal volumes for the ensuing 12 months.

b. Current Quarter Activity

During the June quarter of FY 2001, DNR offered 60 'Board'⁸ timber sales for purchase (total volume of 175 mmbf), of which 55 sold for a volume of 155 mmbf, compared with 128 mmbf sold of 167 mmbf offered in the previous quarter. Fifty-two of the sold sales (150 mmbf) had not been offered for sale previously, compared with 48 first-time sales in the March quarter (for a volume of 121 mmbf).

⁸ 'Board' sales refer to sales having an appraised value of \$100,000 or more, and offering these sales requires approval of the Board of Natural Resources (hence the colloquial name). Board sales generally comprise in excess of some 95% by volume and/or value of all sales sold by the department.

The total value of all timber sales sold in the June quarter was some \$44 million, implying an average stumpage for the quarter of \$273/mbf. This average stumpage represents a \$51/mbf decrease over the March quarter, a 20% decline partly reflecting the quality of product mix offered by the department during this time, and partly reflecting diminished demand.

As shown in Table 7 below, about 684 mmbf of uncut timber was under contract at the end of the third (March) quarter of FY 2001, worth some \$222 million. During the fourth (June) quarter of FY 2001, the volume and value of uncut timber under contract increased by a net 38 mmbf and \$4 million respectively (i.e., after taking defaults, etc. into account).

As might be expected given the decline in stumpage experienced over the June quarter, average stumpages for uncut timber under contract also declined over the June quarter, from \$325/mbf to \$311/mbf (Table 7). This stumpage change reflects the net effect of both new sales sold over the quarter (and especially the quality characteristics of the timber sold) and removals from uncut sales over the same quarter.

Table 7: Current quarter activity--Uncut timber under contract by sale expiration date, June quarter, fiscal year 2001¹

Sale expiration date (year ending June)	Expiring volume (mmbf)	Expiring value (\$millions)	Average price (\$/mbf)
A: At end of previous quarter (March 31, 2001)			
2001	22	7.9	363
2002	238	80.4	338
2003	277	87.5	316
2004	135	42.3	313
TOTAL ²	684	222.4	325
B: At end of current quarter (June 30, 2001)			
2001	0	0.0	0
2002	186	61.7	331
2003	292	91.8	314
2004	197	59.4	302
TOTAL ²	724	225.4	311

Notes:

1. Data are subject to revision with updating of DNR's information systems.
2. Totals may not add due to rounding.

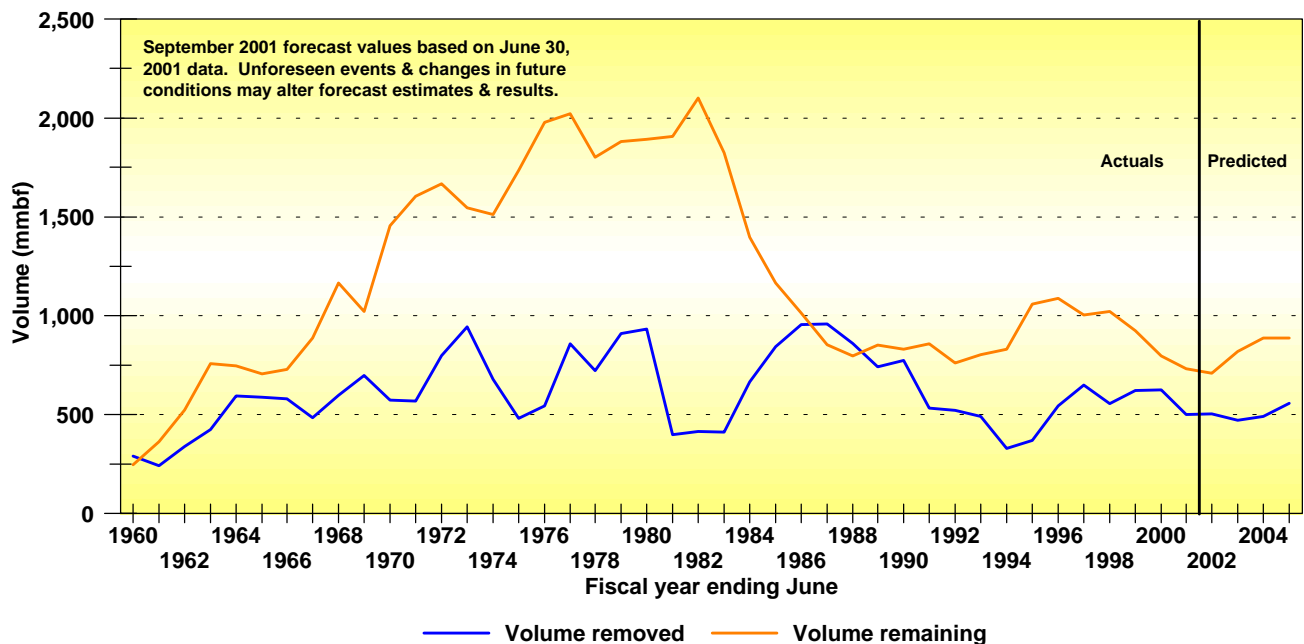
Compared with the previous March quarter, removals from uncut timber under contract were substantially higher (117 mmbf *versus* 89 mmbf). However, this removal level is still low compared with prior June quarters, reflecting the general economy-wide slowing of economic and construction activity.

c. Timber Inventory Levels

From about 731 mmbf at the end of FY 2001, inventory levels (i.e., remaining uncut volume under contract) are projected to decline in FY 2002 to 709 mmbf before rising through FY 2003 to a plateau of about 890 bbf in FY 2004 and FY 2005 (Figure 6). At forecast removal rates, this inventory accumulation represents an increase from about 1.5 years' worth in FY 2001 to a peak of 1.8 years' worth in FY 2004. The rising inventory reflects the dip in removal volumes forecast for FY 2003 and FY 2004.

Interpretation of the predictions of uncut timber under contract requires care however, because the estimates depend on the level of new sales, and on removals from both uncut timber under contract and new sales. The amount of uncut timber under contract, while forecast to increase, likely will remain low by historical levels.

Figure 6: Comparison of volume of timber under contract with standing timber remaining under contract, 1960-2005



d. Timber Removal Prices

Timber removal prices are prices at the time of harvest. A timber removal price is, in effect, a weighted average of sales prices. It is derived as the total value of timber removed from timber sales during a given period, divided by total volume of timber removed from those sales during that same period.

Removal prices are forecast to decline from \$341/mbf in FY 2001 (provisional) to \$321/mbf in FY 2002, before rising through FY 2003 and FY 2004 to \$339/mbf in FY 2005 (Table 8 & Figure 7 opposite). This trend is a direct, though lagged, result of the actual and anticipated trends in timber sales prices. Compared with the June 2001 forecast, average removal prices for the September 2001 forecast are predicted to range from about 2% higher (FY 2003) to about 6% lower (FY 2002) over the forecast period.

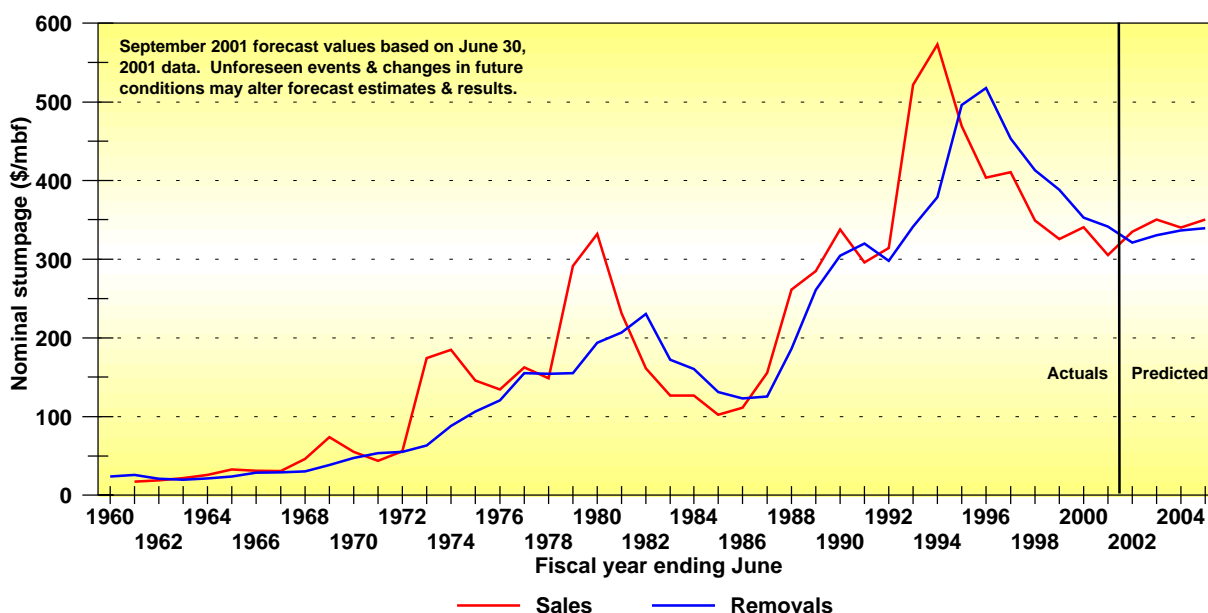
Table 8: Annual timber removal prices--Comparison of September 2001 forecast with June 2001 forecast values , 1998-2005

Fiscal year ending June	June 2001 forecast (\$/mbf)	September 2001 forecast (\$/mbf)	Change (\$/mbf) ¹	Change (%)
1998	413 ²	413 ²	0	0.0
1999	388 ²	388 ²	0	0.0
2000	353 ²	353 ²	0	0.0
2001	340 ³	341 ⁴	1	0.3
2002	324 ³	321 ³	-3	-1.0
2003	323 ³	330 ³	7	2.1
2004	337 ³	336 ³	-1	-0.3
2005	353 ³	339 ³	-13	-3.8

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 7: Comparison of nominal prices for timber sales with nominal prices for timber removals, 1960 - 2005



Note: FY 2001 estimates are preliminary

e. Timber Removal Revenues

Removal revenues are forecast to decline by about 9% through FY 2002 and FY 2003, from an FY 2001 level of \$170.6 million to a low of \$155.5 million in FY 2003, in association with declining removal volumes and prices (Table 9 overleaf). However, removal revenues are expected to increase in the latter years of the forecast period (reaching a peak of \$189.2 million in FY 2005), as the effects of rising removal volumes and prices feed into removal revenues. Over the FY 2000-2005 period, total removal revenues are some \$11.0 million more than estimated in the June 2001 forecast (and \$14.6 million more over the FY 2002-2005 period). However, these estimates of removal revenues are based on estimates of future sales volumes that may not be realized (see pages 14 and 15)

2. Management of Upland Non-Timber Resources

Besides timber revenues, the major upland revenue sources are agricultural activities and commercial real estate leases. Other upland revenue sources include mining, communication site leases, special use leases, right-of-way and easement grants, and non-timber (termed 'special') forest products.

For FY 2001, revenues from DNR's property management activities totaled about \$12 million, while revenues from agricultural activities earned more than \$7 million (Figure 8 overleaf). Non-timber upland revenues are forecast to increase by some \$4.5 million from \$19.2 million in FY 2001 to nearly \$24 million by the end of FY 2005 (Table 10 overleaf). For this September 2001 forecast, non-timber upland revenues are lower than the June 2001 forecast, by about \$1.6 million (1.3%) over the FY 2000-05 forecast period. This revenue decrease

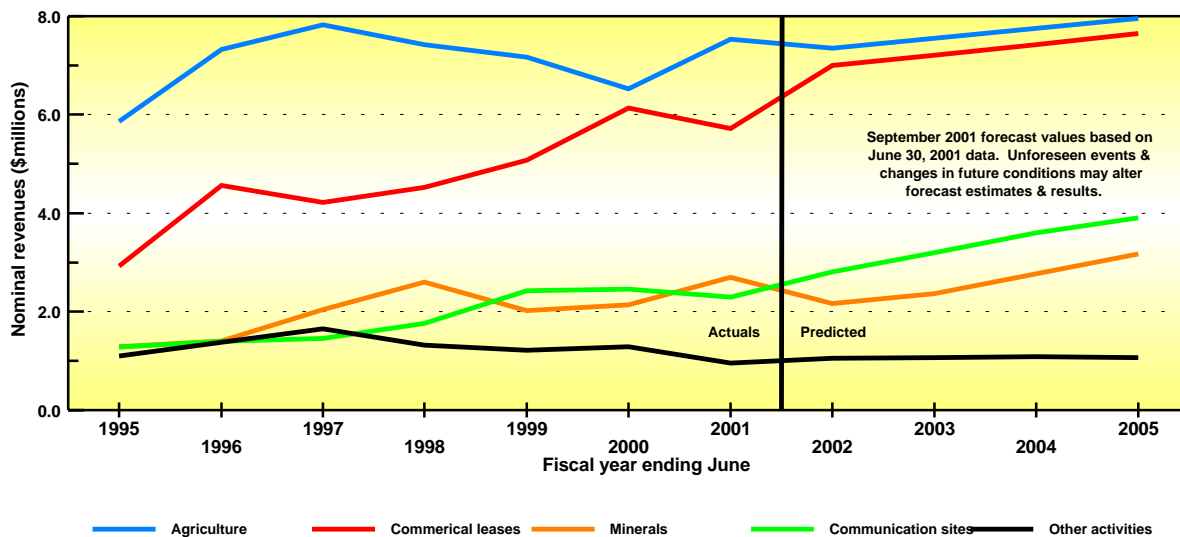
Table 9: Annual timber removal revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005

Fiscal year ending June	June 2001 forecast (\$millions)	September 2001 forecast (\$millions)	Change (\$millions) ¹	Change (%)
1998	229.4 ²	229.4 ²	0.0	0.0
1999	241.8 ²	241.8 ²	0.0	0.0
2000	219.9 ²	219.9 ²	0.0	0.0
2001	173.9 ³	170.6 ⁴	-3.2	-1.9
2002	159.2 ³	161.2 ³	2.0	1.3
2003	145.7 ³	155.5 ³	9.8	6.7
2004	159.9 ³	164.8 ³	4.9	3.1
2005	191.7 ³	189.2 ³	-2.6	-1.3
2000-05 ¹	1,050.2	1,061.2	11.0	1.0

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 8: Actual and forecast non-timber annual revenues by major source, 1995 - 2005



Note: FY 2001 estimates are preliminary

Table 10: Annual non-timber upland revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005

Fiscal year ending June	June 2001 forecast (\$millions)	September 2001 forecast (\$millions)	Change (\$millions) ¹	Change (%)
1998	17.3 ²	17.3 ²	0.0	0.0
1999	17.6 ²	17.6 ²	0.0	0.0
2000	18.5 ²	18.5 ²	0.0	0.0
2001	18.2 ³	19.2 ⁴	1.0	5.6
2002	20.9 ³	20.4 ³	-0.6	-2.8
2003	22.0 ³	21.4 ³	-0.6	-2.7
2004	23.3 ³	22.6 ³	-0.7	-3.0
2005	24.5 ³	23.7 ³	-0.7	-3.1
2000-05 ¹	127.4	125.8	-1.6	-1.3

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

largely reflects reduced forecasts of revenues from special forest products (the department is presently reviewing management of certain of these businesses), communication sites (reflecting changes in demand, especially declining growth rates in the cellular industry and replacement of analog with digital equipment), and reduced demand for rights-of-way as timber markets enter a downturn, the harvestable timber base diminishes, and ownerships become less fragmented.

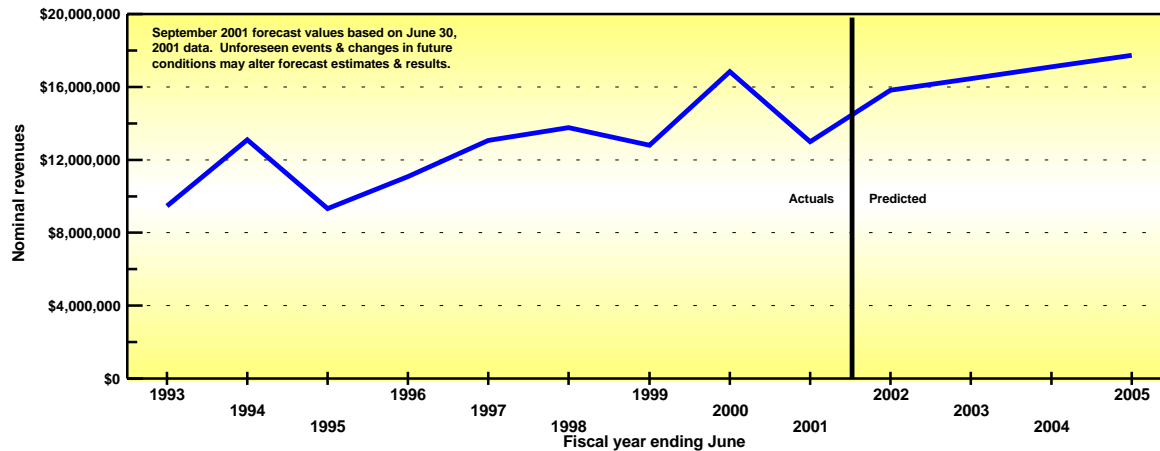
Prospects for increased prices for many agricultural commodities are improving, notably wheat. However, since these price improvements are expected to result from supply-related factors (e.g., reduced production levels resulting from shrinking production bases, weather conditions in the USA and elsewhere, and programs diverting surplus production), their impact is expected to be relatively short-term. Furthermore, the net impact on agricultural revenues is unclear, i.e., will any price increases more than offset production decreases? Beef production is a possible exception though, as a cyclical upturn in beef markets now appears to be underway.

3. Aquatic Land Management

After record revenues of \$16.9 million in FY 2000 (mainly attributable to geoduck sales), aquatic revenues are forecast to increase from \$13.6 million in FY 2001 to over \$17 million in FY 2005 (Figure 9 and Table 11 overleaf). These revenue estimates are down slightly compared with June 2001 forecast estimates (by about 2% over the FY 2000-05 forecast

period), mainly because of updating the underlying data set used for estimating future aquatic revenues. The principal aquatic revenue sources are geoduck sales and water-dependent⁹ leases (Figure 10 opposite). The increase in revenue from 'Other sources' that occurs in FY 2002 reflects capitalized lease income obtained for rights-of-way granted over state-owned aquatic lands.

Figure 9: Actual and forecast estimates of annual aquatic revenues, 1993-2005



Note: FY 2001 estimates are preliminary

Table 11: Annual aquatic revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005

Fiscal year ending June	June 2001 (\$millions)	September 2001 (\$millions)	Change (\$millions) ¹	Change (%)
1998	13.8 ²	13.8 ²	0.0	0.0
1999	12.8 ²	12.8 ²	0.0	0.0
2000	16.9 ²	16.9 ²	0.0	0.0
2001	14.5 ³	13.6 ⁴	-0.9	-6.2
2002	16.0 ³	15.8 ³	-0.2	-1.1
2003	16.7 ³	16.5 ³	-0.2	-1.3
2004	17.4 ³	17.1 ³	-0.3	-1.6
2005	18.0 ³	17.7 ³	-0.3	-1.8
2000-05 ¹	99.4	97.5	-1.9	-1.9

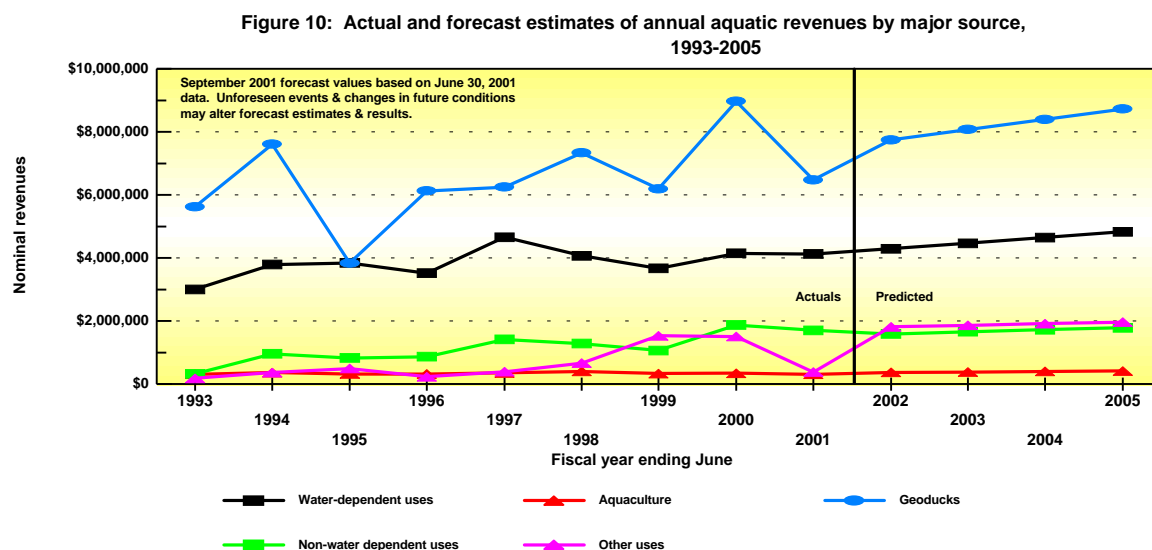
Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

⁹ The distinction between water-dependent and non-water dependent is a legal one. Activities are legally defined as water-dependent if they cannot logically exist in any location except on the water.

Forecasts of geoduck revenues continue to remain susceptible to downside risk, in part because of challenges faced in obtaining a shoreline permit for harvesting geoduck in Kitsap County, and in part because of increased supply of geoduck anticipated from aquaculture and Bush-Callow lands (i.e., tidelands granted by the state to private entities specifically for oyster cultivation). Furthermore, paralytic shellfish poisoning (PSP) has the potential to adversely affect geoduck revenues (although a major benefit purchasers perceive in buying geoduck from the DNR is that the department offers the greatest continuity of supply by spreading harvest areas geographically, thereby minimizing the likelihood of a complete harvest shut-down due to PSP). Revenue impacts associated with these factors have not been included in the forecasts of aquatic revenues. Further details are available in the June 1999 forecast (Glass, 1999).

The aquatic revenue forecasts require cautious interpretation in view of the trend extrapolation technique used to derive them. This forecasting method does not incorporate underlying demand and supply drivers. Alternative methods of estimating these revenues using methods incorporating underlying supply and demand drivers are presently being investigated.



4. Trust Land Transfer Activities

Revenues from trust land transfers payable to the Common School Construction fund amounted to \$24.7 million in FY 2000 and \$31.4 million in FY 2001 (Table 5). Trust land transfer revenue of \$25 million and \$15 million is anticipated in FY 2002 and FY 2003 respectively. This trust land transfer revenue represents the estimated value of the foregone revenues, primarily from timber harvest, resulting from trust land transfer activities (i.e., land values are excluded). These revenues are not estimated in the revenue forecast, but are mentioned here because they do represent trust revenues obtained from land managed by the department. For further details regarding trust land transfers, refer to the November 1997 forecast (Glass, 1997).

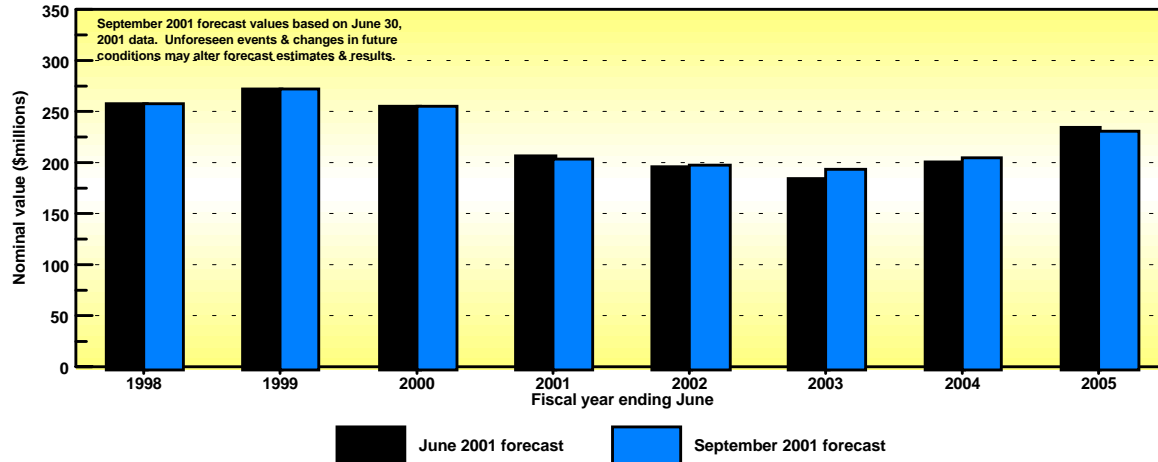
REVENUE DISBURSEMENT

Overview

Total revenues (excluding trust land transfer payments) are forecast to follow a trend similar to timber removal revenues. As illustrated in Figure 11, compared with the June 2001 forecast, total revenues are forecast to decrease from \$203 million in FY 2001 to \$190 million in FY 2002, before rising through FY 2003 and FY 2004 to reach \$231 million in FY 2005.

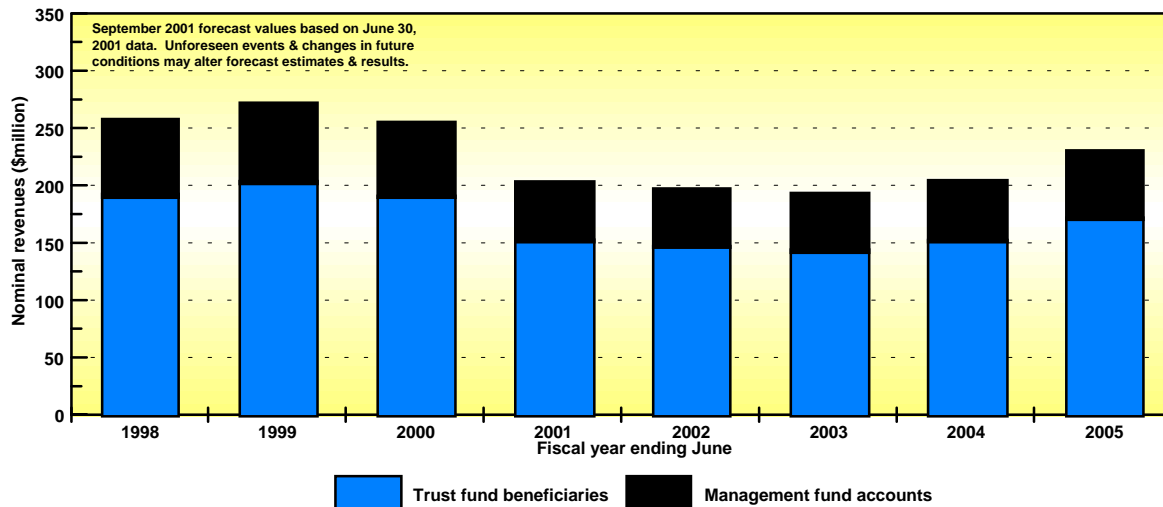
The distribution over time of these revenues between trust beneficiaries and the various management accounts appears in Figure 12. In relative terms, the revenue proportions disbursed to beneficiary and management accounts change little as total revenues rise and fall, although the absolute dollar amounts change substantially.

Figure 11: Total nominal revenues from upland and aquatic land management activities--Comparison of September 2001 forecast with June 2001 forecast, 1998-2005



Note: Excludes Trust Land Transfer activities; FY 2001 estimates are preliminary; Estimates for FY 2002 and beyond are forecasts

Figure 12: Distribution of nominal revenue flows, 1998-2005



Note: Excludes Trust Land Transfer activities; FY estimates are preliminary; Estimates for FY 2002 and beyond are forecasts

1. Revenue Flows to Management Funds

The management funds consist of three parts: the Upland Resource Management Cost Account (RMCA), the Aquatic RMCA, and the Forest Development Account (FDA). In general, revenue flows to the management accounts are deducted at a rate of 22% of revenues earned from managing Forest Board Transfer lands and 50% of revenues earned from Forest Board Purchase lands. Revenues from these Forest Board lands are deposited in the FDA. Apart from the exception noted in the following paragraph, for revenues earned from (upland) federal grant lands, management fee deductions are made at a rate of 25% of total revenues; these revenues are deposited in the Upland RMCA. Management deductions from revenues the department earns managing aquatic lands are deposited in the Aquatic RMCA, with the deductions being made at rates of 20% to 50%, depending upon the type of aquatic land (i.e., bedlands, first class tidelands and shorelands, second class tidelands and shorelands, and harbor areas).

As directed by a recent change in legislation, no management fee deduction is now made from revenues derived from Agricultural College Trust lands. The forecast therefore assumes no management fee will be deducted from Agricultural College Trust revenues for the FY 2000-01 and subsequent biennia.

In line with market conditions, revenue flows to the management funds are forecast to decline through FY 2002 from \$50.7 million in FY 2001 to a low of \$49.3 million in FY 2003, before increasing through FY 2004 to \$58.6 million in FY 2005 (Table 12 overleaf). Over the FY 2000-05 forecast period, management revenues are forecast to average over \$53 million (over \$52 million for the FY 2002-05 period). Compared with the June 2001 forecast, management revenues for the entire FY 2000-05 forecast period are estimated to be about \$0.6 million higher (\$2.0 million higher for the FY 2002-05 period). This change reflects increased timber removals and therefore increased timber revenues. Further details of these revenue flows are presented in Figure 13 and Table 13 overleaf.

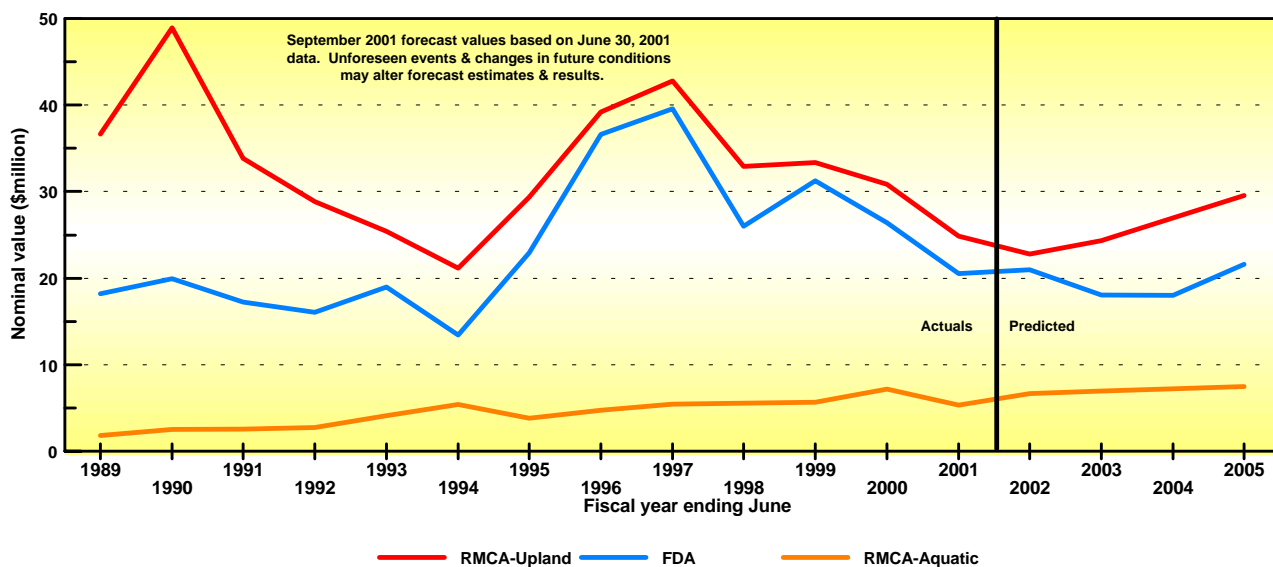
Table 12: Annual total management account revenues--Comparison of September 2001 forecast with June 2001 forecast values, 1998-2005

Fiscal year ending June	June 2001 forecast (\$millions)	September 2001 forecast (\$millions)	Change (\$millions) ¹	Change (%)
1998	65.4 ²	65.4 ²	0.0	0.0
1999	68.3 ²	68.3 ²	0.0	0.0
2000	64.4 ²	64.4 ²	0.0	0.0
2001	52.1 ³	50.7 ⁴	-1.4	-2.8
2002	49.9 ³	50.4 ³	0.5	1.0
2003	47.4 ³	49.3 ³	1.9	4.1
2004	51.5 ³	52.2 ³	0.7	1.4
2005	59.7 ³	58.6 ³	-1.1	-1.8
2000-05 ¹	325.1	325.7	0.6	0.2

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 13: Nominal revenue flows to management accounts by account, 1989-2005



Note: FY 2001 estimates are preliminary

Table 13: Annual revenue flows to Upland and Aquatic Resource Management Cost Accounts, and the Forest Development Account, 1998-2005

Fiscal year ending June	Upland Resource Management Cost Account			Aquatic Resource Management Cost Account			Forest Development Account	
	September 2001 forecast (\$millions)	Change from June 2001 forecast ¹		September 2001 forecast (\$millions)	Change from June 2001 forecast ¹		September 2001 forecast (\$millions)	Change (\$million)
		(\$millions)	(%)		(\$millions)	(%)		
1998	32.8 ²	0.0	0.0	5.8 ²	0.0	0.0	26.8 ²	0.0
1999	32.6 ²	0.0	0.0	5.5 ²	0.0	0.0	30.2 ²	0.0
2000	30.9 ²	0.0	0.0	7.2 ²	0.0	0.0	26.4 ²	0.0
2001	24.9 ³	-0.6	-2.5	5.4 ³	-0.8	-12.4	20.5 ³	-0.0
2002	22.8 ⁴	0.3	1.4	6.7 ⁴	-0.1	-1.2	21.0 ⁴	0.3
2003	24.3 ⁴	0.9	3.7	6.9 ⁴	-0.1	-1.4	18.0 ⁴	1.2
2004	27.0 ⁴	1.2	4.6	7.2 ⁴	-0.1	-1.6	18.0 ⁴	-0.3
2005	29.6 ⁴	-1.0	-3.4	7.5 ⁴	-0.1	-1.8	21.6 ⁴	0.1
2000-05 ¹	169.7	0.8	0.5	41.11	-1.2	-2.9	125.71	1.3

Notes:

1. Totals may not add due to rounding.
2. FY 1998 through FY 2000 data are actuals.
3. Data for FY 2001 are preliminary.

2. Revenue Flows To Trust Funds

After deduction of management expenses to the management funds, the remaining revenues are allocated to individual funds in one of three different fund groups: Current Funds, Aquatic Lands Funds, and Permanent Funds. Details of the forecast revenue flows to these individual funds are summarized in the appendix tables (see pages 52 through 56).

In accordance with market conditions and forecast assumptions, forecast revenue flows to all trust beneficiaries follow similar trends to revenue flows to the management accounts. Trust revenues net of management fees are forecast to decrease through FY 2002 from \$152.7 million in FY 2001 to \$144.0 million in FY 2003, before rising through FY 2003 and FY 2004 to over \$172.0 million in FY 2005 (Table 14). Compared with the June 2001 forecast, total revenues forecast for the entire FY 2000-05 forecast period are estimated to be \$6.8 million higher (\$8.5 million higher for the FY 2002-05 period). Like the change in management fund revenues, this change reflects increased timber removals and therefore increased timber revenues.

Table 14: Annual total trust revenues net of management fees--Comparison of September 2001 forecast with June 2000 forecast values, 1998-2005

Fiscal year ending June	June 2001 forecast (\$millions)	September 2001 forecast (\$millions)	Change (\$millions) ¹	Change (%)
1998	192.4 ²	192.4 ²	0.0	0.0
1999	203.7 ²	203.7 ²	0.0	0.0
2000	190.8 ²	190.8 ²	0.0	0.0
2001	154.4 ³	152.7 ⁴	-1.7	-1.1
2002	146.2 ³	147.0 ³	0.7	0.5
2003	137.0 ³	144.0 ³	7.1	5.2
2004	149.1 ³	152.4 ³	3.2	2.2
2005	174.5 ³	172.0 ³	-2.5	-1.5
2000-05 ¹	952.0	958.9	6.8	0.7

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

SENSITIVITY ANALYSIS

Observing the effects of changes in the assumptions underlying the forecast can provide information regarding how sensitive the estimates are to these assumptions. Such knowledge is useful in interpreting the forecasts themselves, and in determining where modifications in the forecasting model and data will yield greatest improvements.

Timber revenues account for the largest share of total revenues, making it important to understand what factors have a major impact on this particular revenue stream. The key factors affecting forecasts of timber revenues are: (1) stumpage; (2) sales volume; and (3) the rate at which timber is removed from both uncut timber under contract and new sales. Not all of these factors can be readily predicted, thus increasing the likelihood of marked fluctuations in projected revenues from forecast to forecast.

Sensitivity analysis indicates changes in stumpage prices have direct and proportional (though lagged) impacts on timber removal revenues through their effect on timber removal prices (Table 15). Timber removal volumes are apparently not sensitive to stumpage (price) changes, but the validity of this response may be questionable insofar as stumpage changes may make removals from uncut inventory under contract more or less attractive to a purchaser.

Table 15: Effects on timber removal revenues of varying key forecast inputs, 2001-2005

Fiscal year ending June:	2001	2002	2003	2004	2005
Sales prices increase 10%					
Removal volumes	0.0%	0.0%	-2.2%	-0.1%	0.0%
Removal prices	0.0%	0.5%	6.1%	9.6%	9.6%
Removal revenues	0.0%	0.5%	3.8%	9.6%	9.6%
Sales prices decrease 10%					
Removal volumes	0.0%	0.0%	2.6%	0.0%	0.0%
Removal prices	0.0%	-0.5%	-6.3%	-9.6%	-9.6%
Removal revenues	0.0%	-0.5%	-3.9%	-8.6%	-9.6%
Sold volume increases 10%					
Removal volumes	0.0%	5.7%	8.0%	6.6%	9.5%
Removal prices	0.0%	-5.0%	7.1%	9.7%	0.1%
Removal revenues	0.0%	0.5%	15.6%	17.0%	9.6%
Sold volume decreases 10%					
Removal volumes	0.0%	-5.7%	-8.0%	-6.6%	-9.5%
Removal prices	0.0%	5.5%	-6.5%	-9.6%	-0.1%
Removal revenues	0.0%	-0.5%	-13.9%	-15.6%	-9.6%

Removal revenues are partly a lagged function of sales volumes with the impact of prior sales levels being felt for up to three years. Changes in sales volumes have greater than proportional impacts on timber removal revenues two to three years out in the forecast period, because the effects of prior sales are still feeding through into removal volumes and because of rising stumpage (see Table 15). Once this lag is worked out, the timber removal volume and revenue responses decline to levels proportional to the change in sales volume. Timber removal prices also change, at least for the first three years of the forecast period, as part of the adjustment process purchasers go through--purchasers may draw more heavily on uncut timber under contract that is (in this case) more highly priced than that currently being sold, particularly for sales approaching their expiration dates.

Further refinements to the means of estimating removals from uncut timber under contract and new sales will continue to be made and applied in future forecasts.

ANALYSIS OF SELECTED SCENARIOS

The interaction of multiple changes in assumptions on timber removal revenues is illustrated in Table 16 (opposite), for pessimistic and optimistic scenarios, with the current forecast providing the base-case benchmark for comparison. The pessimistic scenario assumes sales prices will decline by 5%, and sales volumes will decrease to 464 mmbf in FY 2002, 477 mmbf in FY 2003, and then decrease by 10% in subsequent years. The optimistic scenario assumes prices will increase by 5%, while the sales volume will increase to 541 mmbf in FY 2002, decrease to 557 mmbf in FY 2003, and then increase by 5% in subsequent years. Timber sales levels for FY 2002 and FY 2003 for both the pessimistic and optimistic scenarios were based on a timber sales scenario assuming recent changes in business practices will have an impact on the volume offered for sale by the department in the near term (estimated to allow the department to offer 515 mmbf and 530 mmbf in FY 2002 and FY 2003 respectively). For FY 2003 and beyond however, timber sales levels will probably be influenced most by the recalculation of the sustainable harvest that the department is currently undertaking, rather than effective changes in business practices.

Both scenarios underscore the importance of timber sales volumes on forecast timber revenues. The marked reduction in timber sales volumes in FY 2003 that is captured in the pessimistic scenario (17.8% decrease) feeds through into major (though declining) reductions in forecast revenues in FY 2004 and subsequent years. In the optimistic scenario, timber sales volumes are not only increased in FY 2002 and FY 2003, but they are also redistributed between these years. Not surprisingly, the effect of selling more timber sooner than is specified in the base case means that timber removal revenues are also received sooner. Inspection of the results presented in Table 16 also indicates the relative sensitivity of removal revenues to changes in sales price and sold volumes, and thereby underscores the importance of obtaining accurate target sales volume data upon which to base sales levels (and actually achieving target sales levels).

Table 16: Comparison with the base-case forecast scenario of changes in timber removal revenues for pessimistic and optimistic scenarios, 2002-2005

Fiscal year ending June:	2002	2003	2004	2005
Pessimistic scenario ¹				
Sales volumes (change)	-3.4%	-17.8%	-10.0%	-10.0%
Sales prices (change)	-5.0%	-5.0%	-5.0%	-5.0%
Removal volumes (change)	-2.0%	-9.4%	-9.1%	-11.6%
Removal prices (change)	-1.6%	-3.6%	-13.9%	-5.0%
Removal revenues (change)	-0.4%	-12.6%	-21.8%	-16.0%
Base-case scenario ^{2,4}				
Sales volumes (mmbf)	480	581	558	557
Sales prices (\$/mbf)	335	350	340	350
Removal volumes (mmbf)	502	471	490	557
Removal prices (\$/mbf)	321	330	336	339
Removal revenues (\$millions)	161.2	155.5	164.8	189.2
Optimistic scenario ³				
Sales volumes (change)	12.7%	-4.1%	5.0%	5.0%
Sales prices (change)	5.0%	5.0%	5.0%	5.0%
Removal volumes (change)	7.3%	-0.2%	0.4%	2.3%
Removal prices (change)	-6.0%	3.1%	9.8%	4.7%
Removal revenues (change)	0.9%	2.9%	10.3%	7.1%

Notes:

1. Pessimistic scenario: Sales prices decrease 5%, sales volume decreases to 464 mmbf in FY 2002, 477 mmbf in FY 2003, and then decreases by 10% in following years.
2. Base-case scenario: No change in prices or sales volume, and no change in timber removal assumptions.
3. Optimistic scenario: Prices increase 5%, sales volume increases to 541 mmbf in FY 2002, decreases to 557 mmbf in FY 2003, and then increases by 5% in following years.
4. Data for FY 2002 and subsequent years are predicted.

FORECAST CONFIDENCE

The philosophy of the forecast is to be as accurate as possible. Where judgment is required, the forecast is based on conservative assumptions so that, on balance, there is more potential for upward than downward changes in the revenue projections. In actuality, the precision of revenue estimates for any single trust or fund is much less than for the forecast as a whole.

Use of these forecast data for budgetary and other purposes needs to reflect the uncertainty surrounding this forecast. Major factors contributing to the uncertainty surrounding this September 2001 forecast include: (1) interest rate movements in response to inflation and growth trends in the U.S. economy; (2) future trends in consumer spending, particularly as influenced by consumer confidence in the wake of terrorist attacks of September 11, 2001; (3) impacts on domestic (US) log prices of restricting exports of softwood lumber from Canada into the USA; and (4) impacts on timber sale volumes of both changes in business practices and re-estimation of the sustainable harvest attainable on lands managed by the department. In addition to being vulnerable to unforeseen events (e.g., the Asian economic downturn, acts of terrorism), the forecast is also vulnerable to events that may be foreseeable but are difficult to predict (e.g., impacts of paralytic shellfish poisoning on geoduck revenue receipts). Marked fluctuations in forecast revenues are therefore possible from forecast to forecast, as evidenced by wide historical fluctuations in timber sales and removals, and timber prices. Such fluctuations tend to be the norm rather than the exception.

Because timber revenues constitute such a large proportion of total revenues from DNR's management activities, the confidence level in the forecast depends in large part upon the degree of confidence in several critical assumptions underpinning the timber component of the revenue forecasting model. These assumptions include:

1. Sales Volumes

Development and implementation of a multi-species habitat conservation program (HCP)¹⁰ has helped the department in managing its timber sales program. However, events beyond the control of the department may nevertheless impact the department's ability to meet its sales targets. These include new listings of endangered species (on forest lands in eastern Washington not covered by the department's HCP, although revenue flows from these lands are relatively small compared with revenues from western Washington forests), improvements in forest management data and information systems (e.g., definition of harvestable lands with respect to identifying streams requiring riparian protection), and legal and legislative actions.

Assumptions about timber sales levels and subsequent timber revenues are also made with a degree of uncertainty. Much of this uncertainty is associated with whether target timber sales volumes will actually be achieved in practice, and what sales targets will

¹⁰ The department's HCP was derived in response to the listing of certain wildlife species under the ESA. It provides a means for DNR to conform to the requirements of the ESA, and to discharge its obligations to trust beneficiaries, on whose behalf DNR manages assets in accord with certain specified obligations.

be implemented and achieved following recalculation of the sustainable harvest . Some uncertainty is also attributable to limited knowledge of not only which trust lands will be harvested but also by the composition of future annual harvests (e.g., proportions of species, sawlogs, commercial thinnings, poles, salvage, etc.).

2. Sales Prices

Prices reflect relative supply and demand. The current forecast assumes that sales prices over the forecast period will tend to track overall levels of economic activity and the end-use demand for wood products, especially in the USA and Japan. Critical factors here include US interest rates, construction activity in Japan, currency fluctuations, and the competitiveness of, and market share held by, US forest products in both foreign and domestic markets. However, timber supply factors will also influence sales prices, in both short and long runs (e.g., marked and sometimes unanticipated sawtimber supply contractions affecting harvest levels on both public and private forestland, dynamics of sawtimber supply adjustments and elasticities).

Future policy governing North American softwood lumber trade is a potentially significant source of uncertainty surrounding the prices estimated in this forecast. Through causative linkages described elsewhere in this forecast (see pages 4 and 5) such trade policy intervention, coupled with Japanese market conditions, will influence the quantities and forms of softwood lumber and logs imported into the USA from Canada, thus affecting domestic lumber prices and stumpages.

3. Removal Volumes

The implementation of a survey of purchasers' harvest intentions has significantly increased confidence in forecasting near-term removals from existing timber sales. Evaluation of how best to estimate removals from new, as yet unsold, sales continues, with recent efforts being incorporated into this forecast. These and future changes will be monitored to assess impacts on forecast accuracy and confidence.

REFERENCES

- Azuma, D.L., K.R. Birch, P. DelZotto, A.A. Herstrom, and G.J. Lettman. 1999. Land use change on non-federal land in western Oregon, 1973-1994. Oregon Department of Forestry. Salem, Oregon, USA.
- Binam, K. Various issues. Western Lumber Facts. Western Wood Products Association, Portland, Oregon, U.S.A.
- Blue Chip Economic Indicators. Various issues. Blue Chip Economic Indicators. Top analysts' forecasts of the U.S. economic outlook for the year ahead. Capitol Publications, Inc., Alexandria, Virginia, USA.
- Bolsinger, C.L. N. McKay, D.R. Gedney, & C. Alerich. 1997. Washington's public and private forests. Resource Bulletin PNW-RB-218, Pacific Northwest Research Station. U.S. Forest Service, Portland, Oregon, USA.
- CVA. Various issues. Macroeconomic outlook. Clear Vision Associates. San Rafael, California, USA.
- CVA. Various issues. Pulp and paper industry outlook. Clear Vision Associates. San Rafael, California, USA.
- CVA. Various issues. Timber and wood products industry outlook. Clear Vision Associates. San Rafael, California, USA.
- Glass, B.P. Various issues. Economic and revenue forecast. Washington State Department of Natural Resources, Olympia, Washington, USA.
- Japan Lumber Journal. Various issues. Tokyo, Japan.
- Japan Wood Products Information and Research Center. Various issues. Wood supply and demand information service. Seattle, Washington, USA.
- Parks, M.J. Various issues. Marple's Business Newsletter. Seattle, Washington, USA.
- RCW 79.90.465. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.
- RCW 79.90.480. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.
- RCW 82.33.020. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.

RISI. Various issues. Timber review. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Lumber commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Monthly economic commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Particleboard & MDF commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Structural panels commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Wood products review. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

The Nikkei Weekly. Various issues. Nihon Keizai Shimbun, Inc. Tokyo, Japan.

Wall Street Journal. Various issues. Money rates. New York, New York, USA.

Wood Resources International Ltd. Various issues. The North American wood fiber review. Bothell, Washington, USA.

GLOSSARY

Biennium: The state's two year budget cycle. The current biennium (FY 2001-03) starts on July 1, 2001 and ends June 30, 2003. The FY 2003-05 biennium starts July 1, 2003 and ends June 30, 2005. The FY 2005-07 biennium starts July 1, 2005 and ends June 30, 2007. Each biennium is made up of two fiscal years, e.g., the FY 2001-03 biennium is made up of FY 2002 and FY 2003.

Board foot (lumber): The common measure of lumber production. One board foot is the equivalent of a board one foot wide, one foot long, and one inch thick. An eight foot long "two by four" contains five and one third board feet. There are twelve board feet in a cubic foot.

Board foot (Scribner): A measure of potential lumber volume of logs or standing timber, estimated using a designated log scale rule. The log volume is expressed in terms of the board footage of lumber which could be sawn from the particular size of log according to log scale rule. The Scribner log scale is the scale rule DNR uses when selling standing trees.

Fiscal year: The budget year for Washington state government, running from July 1 through June 30 of the following calendar year. Fiscal year 2002, for example, runs from July 1, 2001 to June 30, 2002. The first, second, third, and fourth quarters of the fiscal year fall at the ends of September, December, March, and June respectively.

Inventory: Uncut timber under contract, measured in terms of volume and/or value.

Medium density fiberboard: A panel manufactured from wood fibers combined with a resin or other binder and compressed with heat to a density of 31-50 pounds per cubic foot.

Mill conversion efficiency: Product output expressed as a proportion of raw material (wood) input.

New sale: A timber sale for which a sales contract has not yet been let.

Nominal values, prices, and revenues: Values, prices and revenue received in any given year, that have not been adjusted for inflation. This revenue forecast is in nominal terms.

Oriented strand board: A panel made of narrow strands of fiber oriented lengthwise or crosswise in layers, with a binder. May be used for interior or exterior applications.

Particleboard: Panel made from discrete particles of wood (as opposed to wood fibers), mixed with resin, and formed into a solid board under heat and pressure.

Plywood: Panel made by bonding thin sheets of wood (veneers) under pressure, with the grain direction of each veneer being at right angles to the adjacent veneer(s).

Pulpwood: Trees or logs used to manufacture wood chips. These trees and logs are usually of insufficient size and quality to allow them to be processed into lumber.

Remaining: Uncut timber remaining in a sold timber sales contract, measured in terms of volume and/or value.

Removal: Timber removed as part of a sold timber sales contract, measured in terms of volume and/or value.

Sawtimber: Trees or logs of sufficient size and quality that allows them to be processed into lumber or plywood, with wood chips being produced as a by-product.

Stumpage: The price of standing trees.

Timber sale: Sale of standing trees within a specified area for removal within a specified time frame, and subject to certain other contractual requirements. DNR receives payment for timber sales once the purchaser starts to remove timber from the sale.

Uncut timber under contract: That portion of a sold timber sale which has not been harvested.

APPENDIX

FORECAST PERFORMANCE: COMPARISON OF ACTUALS WITH FORECAST ESTIMATES

The end of a fiscal year is a convenient time to assess forecast performance. Such periodic assessments are useful for building forecast confidence. They also aid in interpreting the forecast estimates, and applying those estimates in policy, planning, and operational settings.

The following brief bullet points outline major inferences that can be drawn from the accompanying suite of charts. These charts compare the difference between various forecast estimates and actual values (expressed as a percentage difference) for selected forecast measures, and how these differences have changed over time from forecast to forecast.

Inferring forecast performance from these charts requires exercise of considerable caution. It is extremely tempting to take the following charts at face value, and assert the forecast was on or off the target at a certain time. However, this perspective overlooks the use of the forecast. The forecast paints a picture of the future at a given time, and that picture may or may not be realized for reasons both within and beyond departmental influence and control. One purpose of a forecast, though, is to prompt a managerial response, and an irony of forecasting is that managerial responses resulting from a forecast may be deliberately directed at ensuring the forecast is not actually realized in practice.

Using the thin black lines in Figure A1 as guides, the charts may be interpreted as follows. For the forecast based on March 1998 base-line data, i.e., the June 1999 forecast, the target timber sale volume was 13% higher than was actually realized.

- *Timber sale volumes (Figure A1):* Tendency for target sales volume to be greater than realized volume.
- *Timber sales prices (Figure A2):* Tendency toward overestimation; Estimation variability tends to diminish as realized outcome date is approached.
- *Timber removal volumes (Figure A3):* Historical tendency toward underestimation, resulting from conservative removal rate assumption (i.e., removals are assumed to occur in the last year of the contract). More recent forecasts exhibit greater precision and less directional bias, i.e., estimation variability tends to diminish as realized outcome date is approached..
- *Timber removal prices (Figure A4):* Historical tendency toward overestimation, but little directional bias and low variability in recent forecast estimates.
- *Timber removal revenues (Figure A5):* Historical tendency toward underestimation, resulting from conservative removal rate assumption (i.e., removals are assumed to occur in the last year of the contract). More recent forecasts exhibit greater precision and less directional bias, i.e., estimation variability tends to diminish as realized outcome date is approached.

- *Agriculture & mineral revenues (Figure A6)*: Recent tendency toward overestimation, but forecast estimates show relatively little variation about the actual values (possibly because most revenue streams have little market exposure).
- *Commercial real estate revenues (Figure A7)*: Historical tendency toward overestimation, but the more recent tendency is toward underestimation. Recent forecast estimates show reduced variability.
- *Aquatic revenues (Figure A8)*: Tendency toward over rather than underestimation (except FY 2000). No forecast estimates available prior to September 1996, i.e., November 1996 forecast.
- *Total revenues (Figure A9)*: Tendency towards underestimation. Estimation variability tends to diminish as realized outcome date is approached.

Figure A1: Difference between target and actual values for timber sale volumes by fiscal year

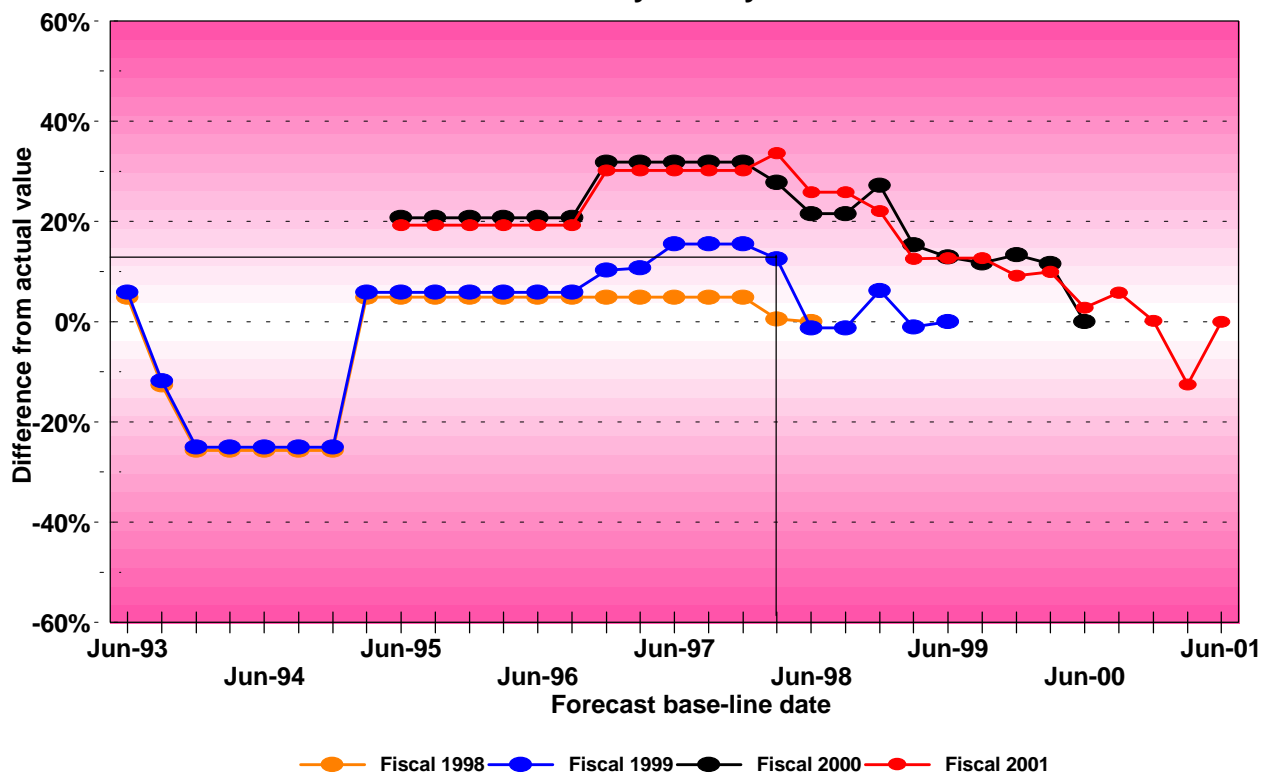


Figure A2: Difference between forecast and actual values for timber sale prices by fiscal year

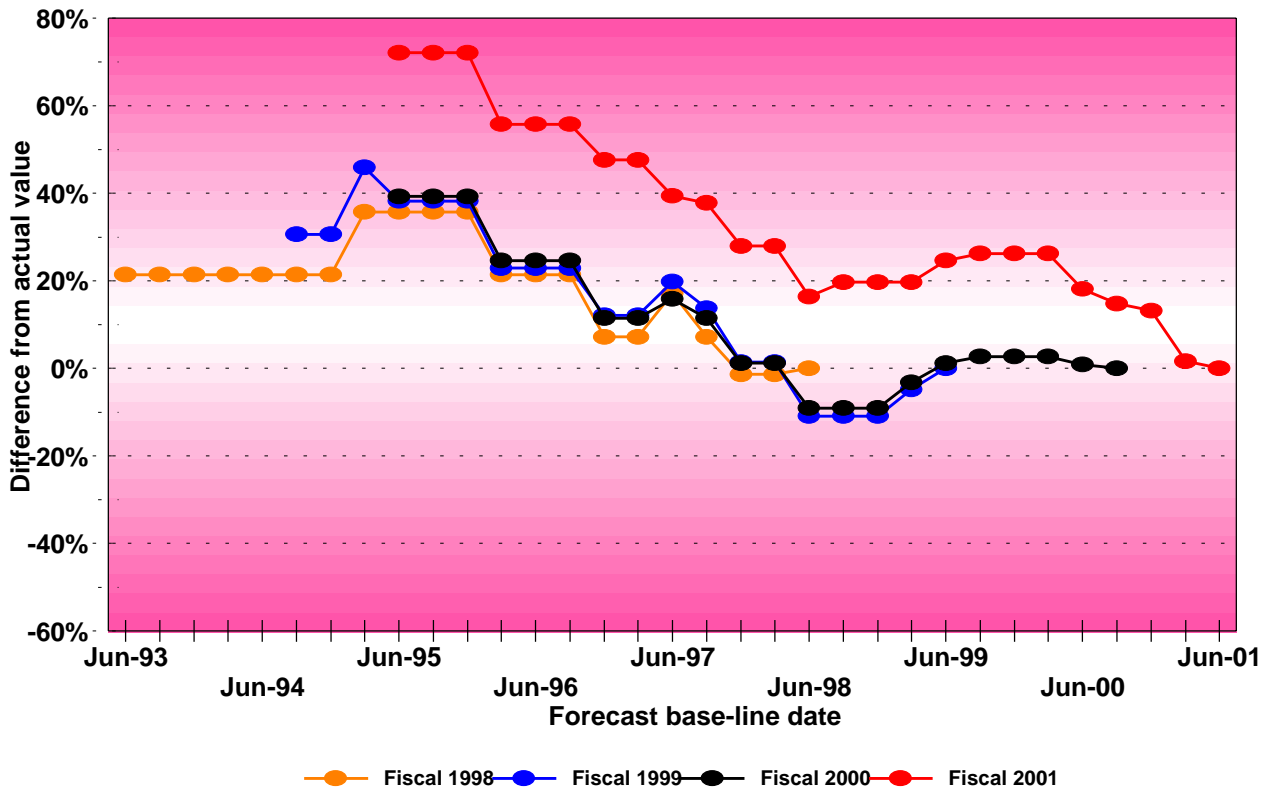


Figure A3: Difference between forecast and actual values for timber removal volumes by fiscal year

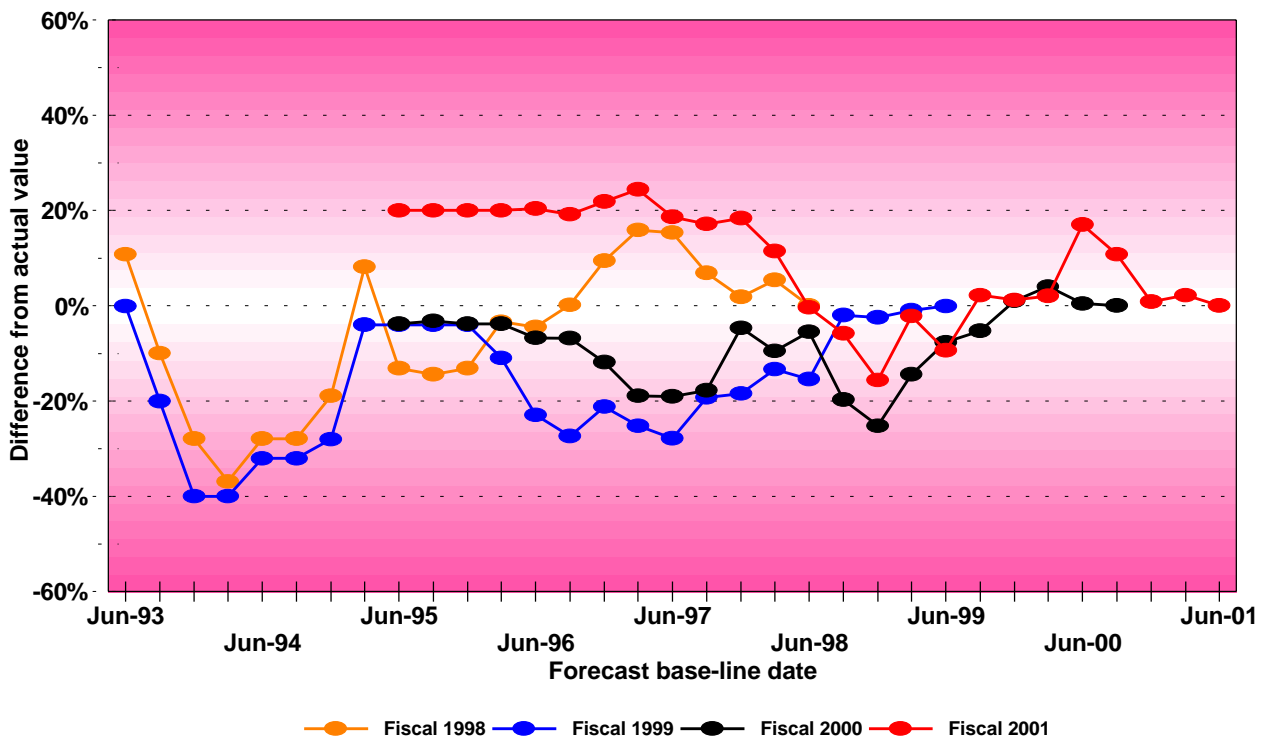


Figure A4: Difference between forecast and actual values for timber removal prices by fiscal year

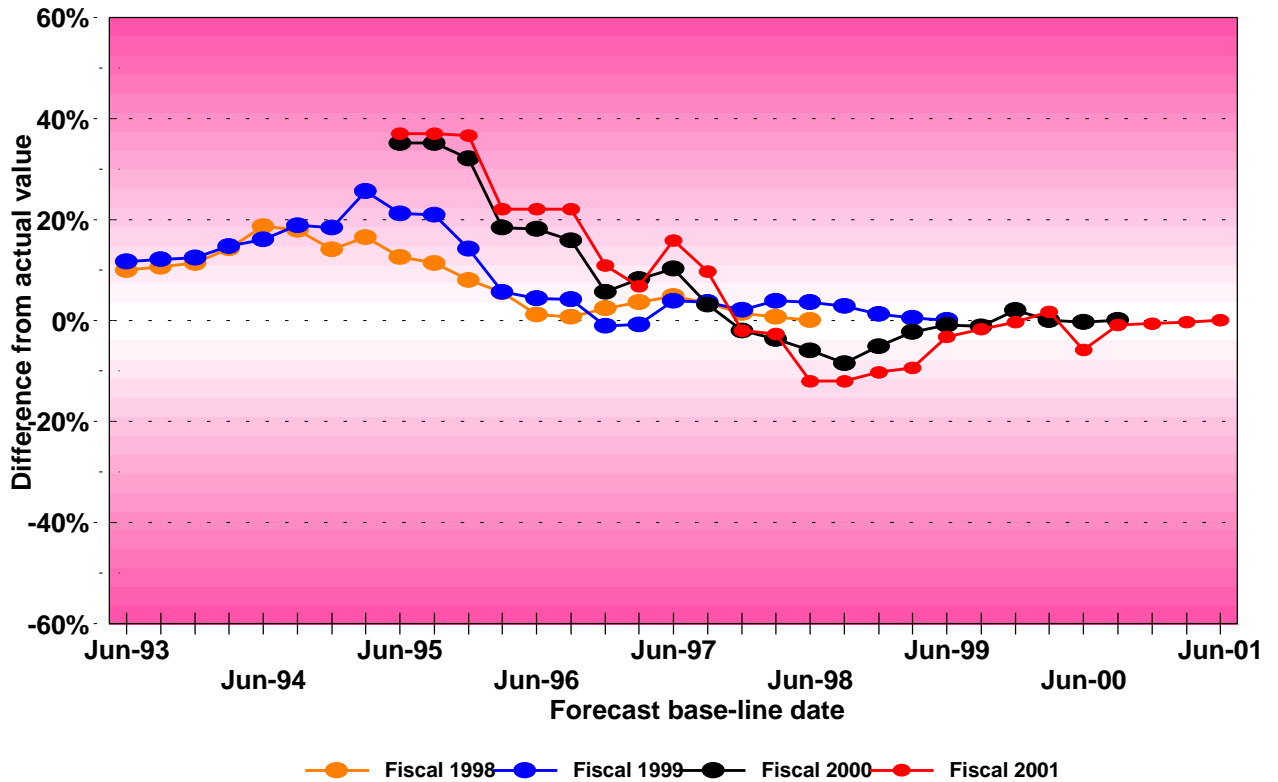


Figure A5: Difference between forecast and actual values for timber removal revenues by fiscal year

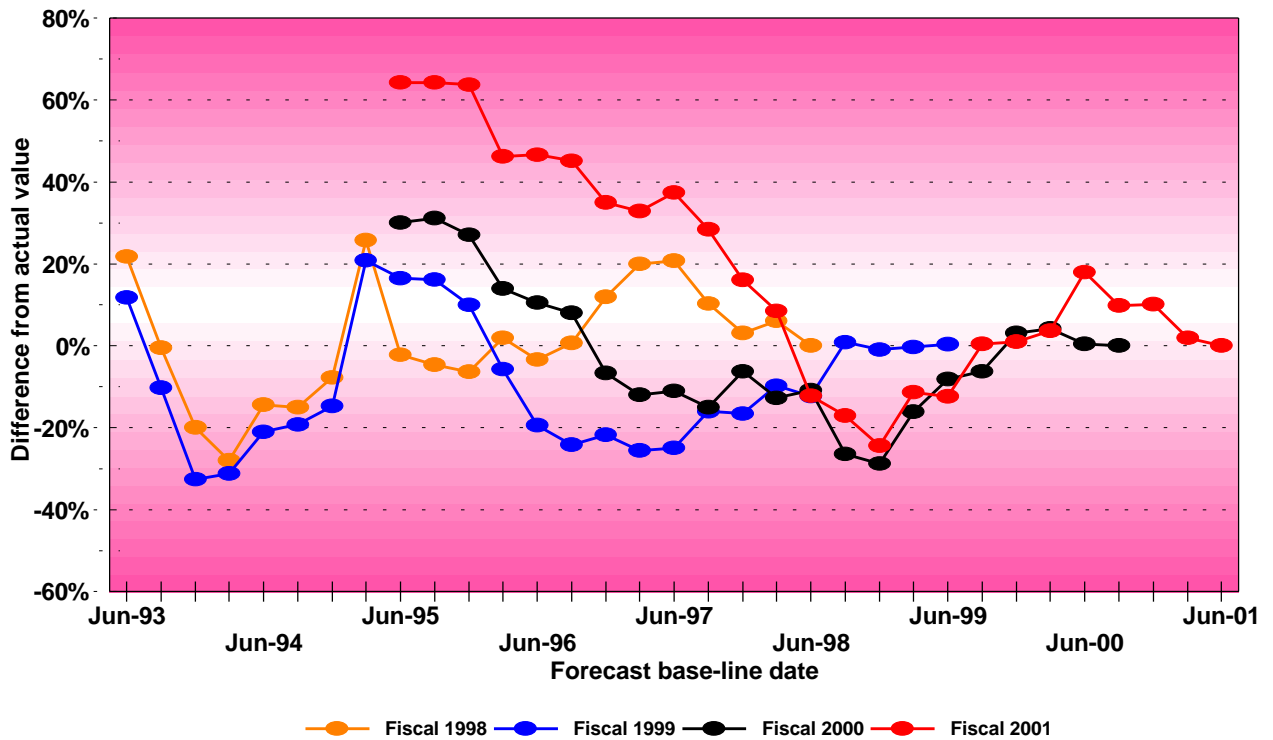


Figure A6: Difference between forecast and actual values for agricultural and mineral lease revenues by fiscal year

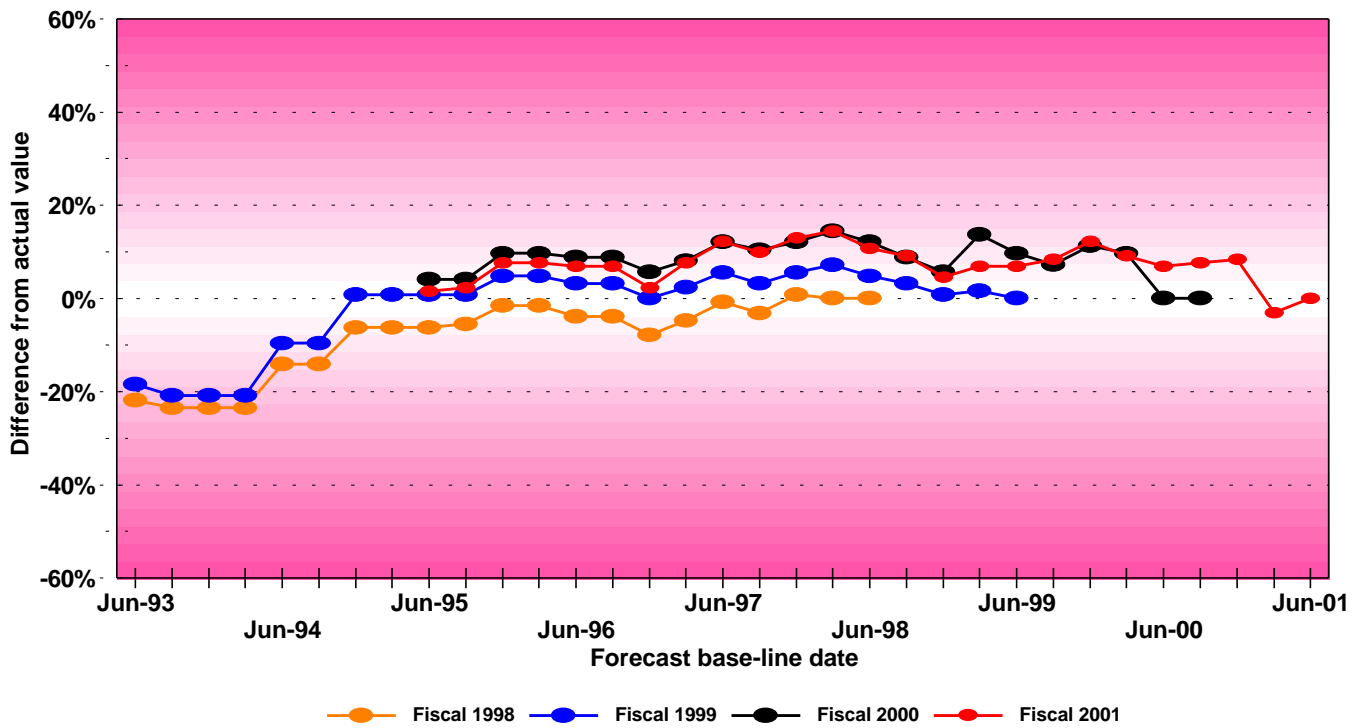


Figure A7: Difference between forecast and actual values for commercial real estate lease revenues by fiscal year

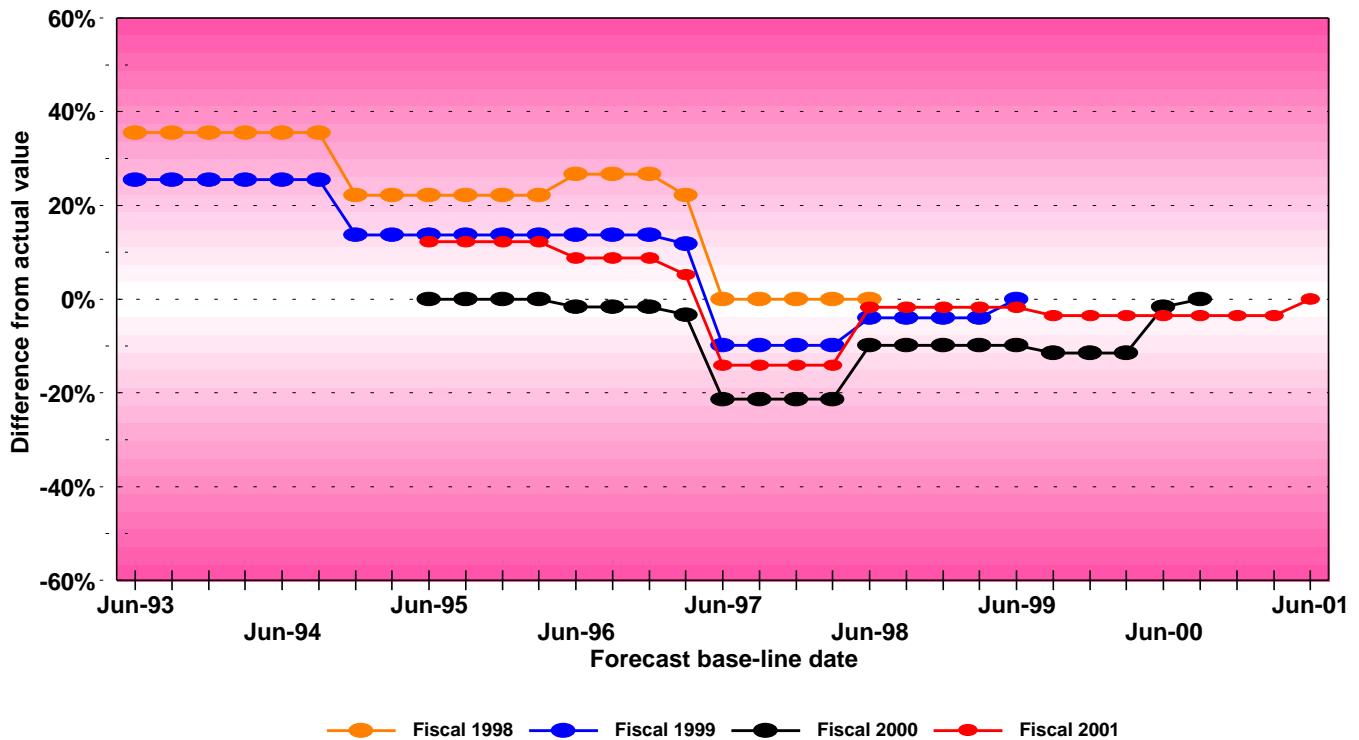


Figure A8: Difference between forecast and actual values for aquatic revenues by fiscal year

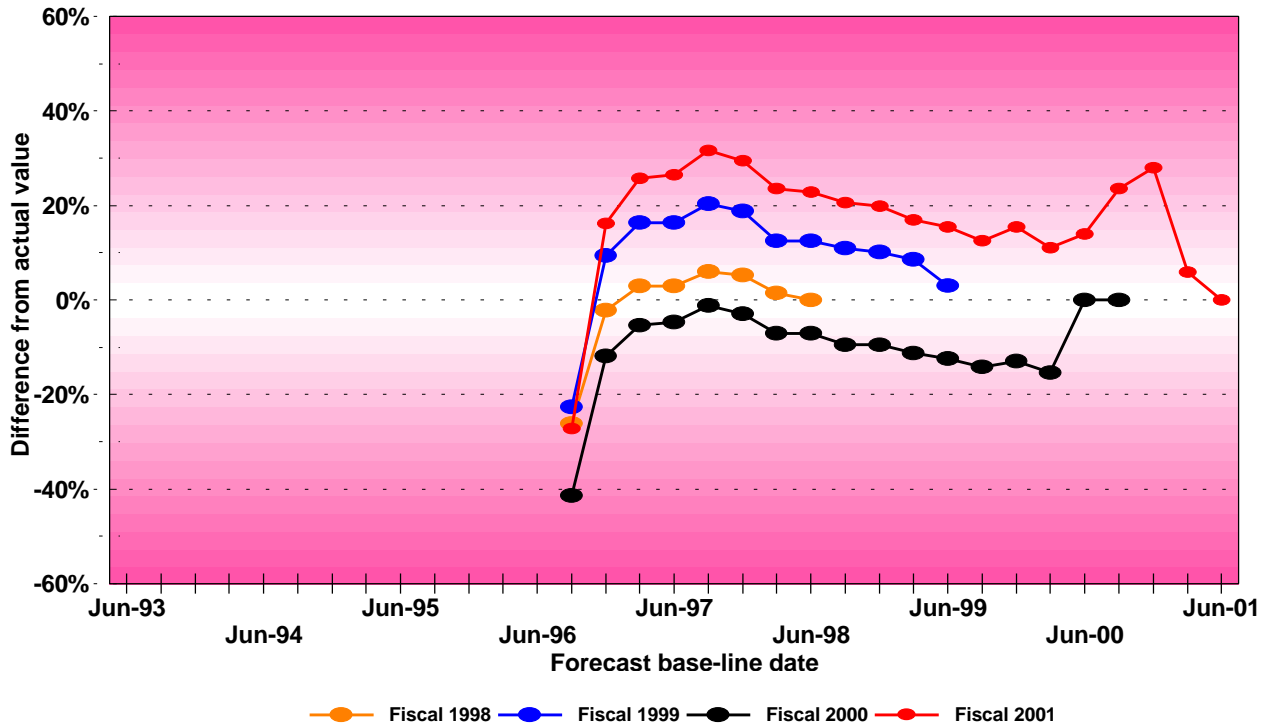


Figure A9: Difference between forecast and actual values for total revenues by fiscal year

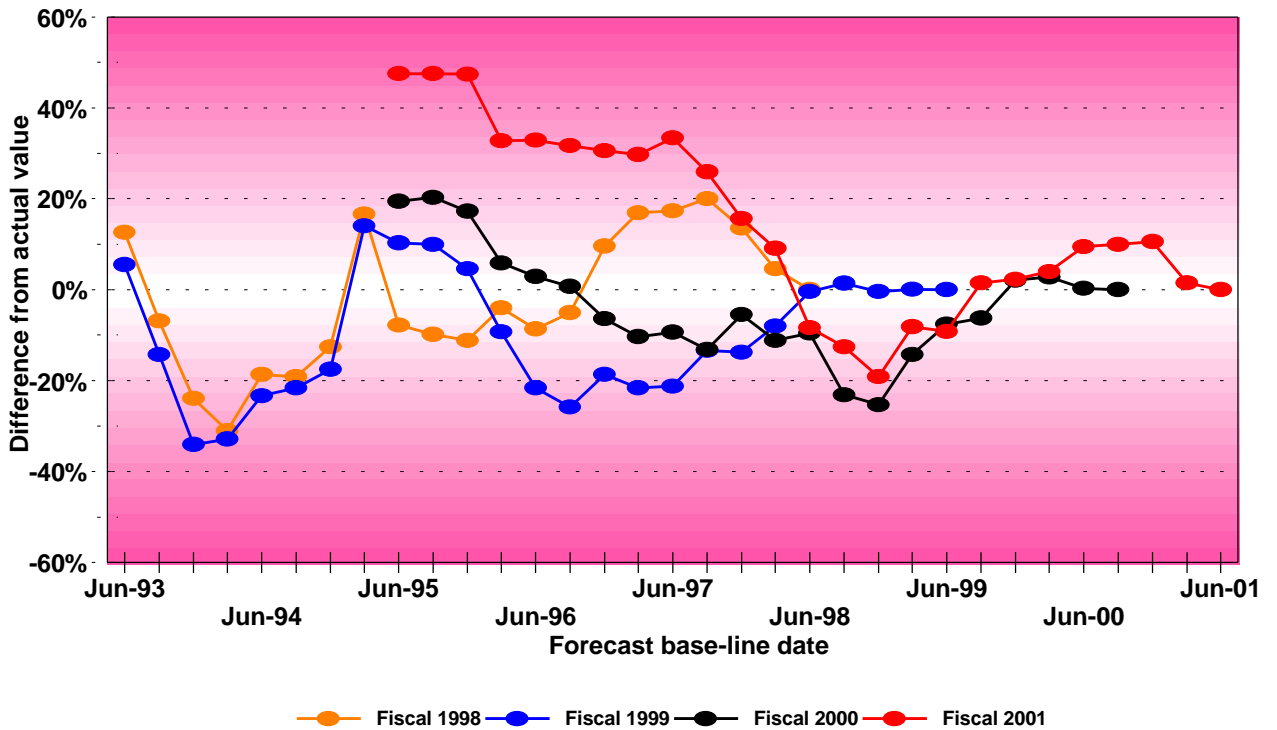


Table A1: Projected trust revenues by fund and fiscal year, June 2001 forecast, 2000-2005 (\$millions)

Fiscal year		2000	Actual 07/01/2000 to 03/31/2001	Projected 2001	Projected 2002	Projected 2003	Projected 2004	Projected 2005
MANAGEMENT ACCOUNTS								
041	RMCA - UPLAND	\$30.9	\$20.0	\$25.5	\$22.4	\$23.5	\$25.8	\$30.6
041	RMCA - AQUATIC	\$7.2	\$3.9	\$6.1	\$6.8	\$7.0	\$7.3	\$7.6
014	FDA	\$26.4	\$14.8	\$20.5	\$20.7	\$16.9	\$18.4	\$21.5
		-----	-----	-----	-----	-----	-----	-----
		\$64.4	\$38.6	\$52.1	\$49.9	\$47.4	\$51.5	\$59.7
CURRENT FUNDS								
113	COMMON SCHOOL CONSTRUCTION	\$66.0	\$43.3	\$55.1	\$45.8	\$49.6	\$55.7	\$66.1
999	FOREST BOARD COUNTIES	\$81.0	\$46.3	\$63.1	\$64.7	\$49.5	\$54.8	\$64.5
001	GENERAL FUND	\$5.2	\$2.8	\$4.1	\$3.0	\$4.4	\$4.3	\$4.1
348	UNIVERSITY BOND RETIREMENT	\$0.3	\$1.1	\$1.1	\$1.2	\$0.9	\$0.9	\$1.0
347	WSU BOND REPAYMENT	\$0.5	\$0.4	\$0.6	\$0.7	\$0.7	\$0.8	\$0.8
042	CEP&RI	\$5.1	\$2.3	\$3.4	\$4.5	\$3.1	\$3.7	\$4.8
036	CAPITOL BUILDING CONSTRUCTION	\$8.2	\$4.8	\$6.3	\$6.1	\$7.3	\$6.5	\$8.1
061/3/5/6	NORMAL SCHOOL	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
	OTHER FUNDS	\$0.0	\$0.0	\$0.1	\$0.3	\$0.1	\$0.1	\$0.2
		-----	-----	-----	-----	-----	-----	-----
		\$166.4	\$101.2	\$134.0	\$126.3	\$115.7	\$126.9	\$149.7
AQUATIC LANDS ENHANCEMENT ACCOUNT								
02R	AQUATIC LANDS	\$9.7	\$5.5	\$8.4	\$9.2	\$9.6	\$10.0	\$10.4
PERMANENT FUNDS								
601	AGRICULTURAL COLLEGE	\$2.6	\$1.7	\$2.1	\$1.5	\$2.8	\$2.4	\$3.4
604	NORMAL SCHOOL PERMANENT	\$5.5	\$2.8	\$4.0	\$3.0	\$3.4	\$3.5	\$3.4
605	COMMON SCHOOL PERMANENT	\$1.0	\$0.7	\$0.7	\$0.9	\$1.0	\$1.3	\$1.4
606	SCIENTIFIC PERMANENT	\$4.7	\$3.9	\$4.4	\$4.7	\$3.7	\$4.5	\$5.5
607	UNIVERSITY PERMANENT	\$1.0	\$0.5	\$0.8	\$0.4	\$0.8	\$0.6	\$0.7
		-----	-----	-----	-----	-----	-----	-----
		\$14.7	\$9.6	\$12.0	\$10.6	\$11.7	\$12.2	\$14.4
	TOTAL TO TRUST BENEFICIARY FUNDS	\$190.8	\$116.3	\$154.4	\$146.2	\$137.0	\$149.1	\$174.5
	TOTAL ALL FUNDS	\$255.3	\$155.0	\$206.5	\$196.1	\$184.4	\$200.6	\$234.3

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01 (preliminary), and \$50.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A2: Projected trust revenues by fund and fiscal year, September 2001 forecast, 2000-2005 (\$millions)

Fiscal year	2000	Actual 07/01/2000 to 06/30/2001	Projected 2001	Projected 2002	Projected 2003	Projected 2004	Projected 2005
MANAGEMENT ACCOUNTS							
041 RMCA - UPLAND	\$30.9	\$24.7	\$24.9	\$22.8	\$24.3	\$27.0	\$29.6
041 RMCA - AQUATIC	\$7.2	\$5.4	\$5.4	\$6.7	\$6.9	\$7.2	\$7.5
014 FDA	\$26.4	\$20.6	\$20.5	\$21.0	\$18.0	\$18.0	\$21.6
	-----	-----	-----	-----	-----	-----	-----
	\$64.4	\$50.7	\$50.7	\$50.4	\$49.3	\$52.2	\$58.6
CURRENT FUNDS							
113 COMMON SCHOOL CONSTRUCTION	\$66.0	\$52.3	\$52.3	\$46.0	\$50.6	\$59.5	\$64.5
999 FOREST BOARD COUNTIES	\$81.0	\$64.3	\$64.0	\$64.0	\$53.1	\$53.5	\$64.0
001 GENERAL FUND	\$5.2	\$3.8	\$3.8	\$3.5	\$4.0	\$3.5	\$4.2
348 UNIVERSITY BOND RETIREMENT	\$0.3	\$1.1	\$1.1	\$1.1	\$1.2	\$1.3	\$1.3
347 WSU BOND REPAYMENT	\$0.5	\$0.6	\$0.6	\$0.6	\$0.7	\$0.8	\$0.8
042 CEP&RI	\$5.1	\$3.5	\$3.6	\$4.8	\$4.5	\$4.0	\$4.6
036 CAPITOL BUILDING CONSTRUCTION	\$8.2	\$6.5	\$6.5	\$7.3	\$6.7	\$6.0	\$7.1
061/3/5/6 NORMAL SCHOOL	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
OTHER FUNDS	\$0.0	\$0.1	\$0.1	\$0.2	\$0.2	\$0.5	\$0.4
	-----	-----	-----	-----	-----	-----	-----
	\$166.4	\$132.3	\$132.2	\$127.7	\$121.0	\$129.1	\$146.9
AQUATIC LANDS ENHANCEMENT ACCOUNT							
02R AQUATIC LANDS	\$9.7	\$7.7	\$8.2	\$9.1	\$9.5	\$9.9	\$10.2
PERMANENT FUNDS							
601 AGRICULTURAL COLLEGE	\$2.6	\$1.8	\$1.8	\$1.6	\$4.1	\$4.1	\$4.4
604 NORMAL SCHOOL PERMANENT	\$5.5	\$4.3	\$4.3	\$2.8	\$3.3	\$3.3	\$3.5
605 COMMON SCHOOL PERMANENT	\$1.0	\$0.7	\$0.8	\$0.9	\$1.0	\$1.1	\$1.3
606 SCIENTIFIC PERMANENT	\$4.7	\$4.7	\$4.7	\$4.0	\$4.5	\$4.1	\$4.9
607 UNIVERSITY PERMANENT	\$1.0	\$0.6	\$0.6	\$0.8	\$0.6	\$0.7	\$0.6
	-----	-----	-----	-----	-----	-----	-----
	\$14.7	\$12.1	\$12.3	\$10.1	\$13.6	\$13.4	\$14.8
TOTAL TO TRUST BENEFICIARY FUNDS	\$190.8	\$152.1	\$152.7	\$147.0	\$144.0	\$152.4	\$172.0
TOTAL ALL FUNDS	\$255.3	\$202.8	\$203.4	\$197.3	\$193.4	\$204.6	\$230.6

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01 (preliminary), and \$50.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A3: Change from June 2001 to September 2001 forecast-Projected trust revenues by fund and fiscal year, 2000-2005 (\$millions)

Fiscal year		2000	Projected 2001	Projected 2002	Projected 2003	Projected 2004	Projected 2005
MANAGEMENT ACCOUNTS							
041	RMCA - UPLAND	\$0.0	(\$0.6)	\$0.3	\$0.9	\$1.2	(\$1.0)
041	RMCA - AQUATIC	\$0.0	(\$0.8)	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.1)
014	FDA	\$0.0	(\$0.0)	\$0.3	\$1.2	(\$0.3)	\$0.1
		-----	-----	-----	-----	-----	-----
		\$0.0	(\$1.4)	\$0.5	\$1.9	\$0.7	(\$1.1)
CURRENT FUNDS							
113	COMMON SCHOOL CONSTRUCTION	\$0.0	(\$2.8)	\$0.2	\$0.9	\$3.8	(\$1.6)
999	FOREST BOARD COUNTIES	\$0.0	\$0.9	(\$0.7)	\$3.6	(\$1.3)	(\$0.5)
001	GENERAL FUND	\$0.0	(\$0.2)	\$0.5	(\$0.4)	(\$0.8)	\$0.1
348	UNIVERSITY BOND RETIREMENT	\$0.0	(\$0.0)	(\$0.1)	\$0.3	\$0.4	\$0.3
347	WSU BOND REPAYMENT	\$0.0	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.0
042	CEP&RI	\$0.0	\$0.1	\$0.3	\$1.4	\$0.3	(\$0.3)
036	CAPITOL BUILDING CONSTRUCTION	\$0.0	\$0.2	\$1.2	(\$0.7)	(\$0.6)	(\$1.0)
061/3/5/6	NORMAL SCHOOL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.0)
	OTHER FUNDS	\$0.0	(\$0.0)	(\$0.0)	\$0.0	\$0.4	\$0.2
		-----	-----	-----	-----	-----	-----
		\$0.0	(\$1.8)	\$1.4	\$5.3	\$2.2	(\$2.8)
AQUATIC LANDS ENHANCEMENT ACCOUNT							
02R	AQUATIC LANDS	\$0.0	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.1)	(\$0.2)
PERMANENT FUNDS							
601	AGRICULTURAL COLLEGE	\$0.0	(\$0.3)	\$0.1	\$1.3	\$1.8	\$1.0
604	NORMAL SCHOOL PERMANENT	\$0.0	\$0.4	(\$0.2)	(\$0.1)	(\$0.2)	\$0.2
605	COMMON SCHOOL PERMANENT	\$0.0	\$0.1	(\$0.0)	(\$0.0)	(\$0.1)	(\$0.1)
606	SCIENTIFIC PERMANENT	\$0.0	\$0.3	(\$0.7)	\$0.8	(\$0.4)	(\$0.6)
607	UNIVERSITY PERMANENT	\$0.0	(\$0.2)	\$0.3	(\$0.1)	\$0.1	(\$0.0)
		-----	-----	-----	-----	-----	-----
		\$0.0	\$0.3	(\$0.5)	\$1.9	\$1.2	\$0.4
	TOTAL TO TRUST BENEFICIARY FUNDS	\$0.0	(\$1.7)	\$0.7	\$7.1	\$3.2	(\$2.5)
	TOTAL ALL FUNDS	\$0.0	(\$3.1)	\$1.2	\$9.0	\$4.0	(\$3.6)

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01 (preliminary), and \$50.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A4: Change from June 2001 to September 2001 forecast-Projected trust revenues by fund and fiscal year, 2000-2005 (%)

Fiscal year		2000	Projected 2001	Projected 2002	Projected 2003	Projected 2004	Projected 2005
MANAGEMENT ACCOUNTS							
041	RMCA - UPLAND	0.0%	-2.5%	1.4%	3.7%	4.6%	-3.4%
041	RMCA - AQUATIC	0.0%	-12.4%	-1.2%	-1.4%	-1.6%	-1.8%
014	FDA	0.0%	-0.1%	1.3%	7.0%	-1.8%	0.4%
		-----	-----	-----	-----	-----	-----
		0.0%	-2.8%	1.0%	4.1%	1.4%	-1.8%
CURRENT FUNDS							
113	COMMON SCHOOL CONSTRUCTION	0.0%	-5.1%	0.4%	1.9%	6.8%	-2.5%
999	FOREST BOARD COUNTIES	0.0%	1.5%	-1.1%	7.2%	-2.4%	-0.7%
001	GENERAL FUND	0.0%	-6.0%	16.4%	-8.5%	-18.4%	3.3%
348	UNIVERSITY BOND RETIREMENT	0.0%	-2.3%	-8.2%	37.5%	41.0%	29.5%
347	WSU BOND REPAYMENT	0.0%	6.0%	-0.9%	-0.7%	0.7%	0.5%
042	CEP&RI	0.0%	4.3%	6.4%	45.8%	9.1%	-5.2%
036	CAPITOL BUILDING CONSTRUCTION	0.0%	2.8%	20.1%	-9.0%	-8.7%	-12.6%
061/3/5/6	NORMAL SCHOOL	0.0%	18.7%	5.7%	0.4%	0.0%	-5.1%
	OTHER FUNDS	0.0%	-11.2%	-14.6%	41.9%	307.9%	105.1%
		-----	-----	-----	-----	-----	-----
		0.0%	-1.3%	1.1%	4.6%	1.8%	-1.9%
AQUATIC LANDS ENHANCEMENT ACCOUNT							
02R	AQUATIC LANDS	0.0%	-1.6%	-1.0%	-1.3%	-1.5%	-1.7%
PERMANENT FUNDS							
601	AGRICULTURAL COLLEGE	0.0%	-14.1%	7.5%	48.0%	75.1%	28.8%
604	NORMAL SCHOOL PERMANENT	0.0%	8.8%	-7.6%	-2.4%	-6.9%	5.3%
605	COMMON SCHOOL PERMANENT	0.0%	16.8%	-3.1%	-2.0%	-8.6%	-8.1%
606	SCIENTIFIC PERMANENT	0.0%	6.8%	-15.0%	21.4%	-8.8%	-11.4%
607	UNIVERSITY PERMANENT	0.0%	-25.7%	73.6%	-17.4%	22.9%	-2.0%
		-----	-----	-----	-----	-----	-----
		0.0%	2.2%	-5.1%	16.1%	9.6%	2.8%
	TOTAL TO TRUST BENEFICIARY FUNDS	0.0%	-1.1%	0.5%	5.2%	2.2%	-1.5%
	TOTAL ALL FUNDS	0.0%	-1.5%	0.6%	4.9%	2.0%	-1.6%

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01 (preliminary), and \$50.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A5: Revenue projections by fund and biennium, September 2001 forecast, 1995-2005 (\$millions)

Fiscal years	1995-97	1997-99	Biennium to 06/30/2001	Projected 1999-2001	Projected 2001-2003	Projected 2003-2005
MANAGEMENT ACCOUNTS						
041 RMCA - UPLAND	\$79.9	\$65.4	\$55.6	\$55.7	\$47.1	\$56.5
041 RMCA - AQUATIC	\$10.0	\$11.3	\$12.5	\$12.5	\$13.6	\$14.7
014 FDA	\$74.2	\$56.9	\$47.0	\$46.9	\$39.0	\$39.6
	-----	-----	-----	-----	-----	-----
	\$164.1	\$133.6	\$115.1	\$115.2	\$99.7	\$110.8
CURRENT FUNDS						
113 COMMON SCHOOL CONSTRUCTION	\$166.4	\$133.6	\$118.4	\$118.4	\$96.6	\$124.0
999 FOREST BOARD COUNTIES	\$195.1	\$172.9	\$145.3	\$145.0	\$117.1	\$117.4
001 GENERAL FUND	\$14.4	\$11.7	\$9.1	\$9.1	\$7.5	\$7.7
348 UNIVERSITY BOND RETIREMENT	\$4.3	\$3.3	\$1.4	\$1.4	\$2.3	\$2.6
347 WSU BOND REPAYMENT	\$0.9	\$1.1	\$1.0	\$1.1	\$1.4	\$1.6
042 CEP&RI	\$17.3	\$10.4	\$8.6	\$8.7	\$9.4	\$8.6
036 CAPITOL BUILDING CONSTRUCTION	\$11.5	\$13.8	\$14.7	\$14.7	\$14.0	\$13.1
061/3/5/6 NORMAL SCHOOL	\$0.2	\$0.1	\$0.2	\$0.1	\$0.1	\$0.1
OTHER FUNDS	\$0.1	\$0.2	\$0.1	\$0.1	\$0.4	\$0.9
	-----	-----	-----	-----	-----	-----
	\$410.2	\$347.2	\$298.7	\$298.6	\$248.7	\$276.0
AQUATIC LANDS ENHANCEMENT ACCOUNT						
02R AQUATIC LANDS	\$14.2	\$15.3	\$17.4	\$17.9	\$18.7	\$20.1
PERMANENT FUNDS						
601 AGRICULTURAL COLLEGE	\$9.6	\$7.0	\$4.4	\$4.4	\$5.7	\$8.6
604 NORMAL SCHOOL PERMANENT	\$7.5	\$7.1	\$9.8	\$9.8	\$6.1	\$6.8
605 COMMON SCHOOL PERMANENT	\$1.8	\$1.8	\$1.8	\$1.9	\$1.9	\$2.5
606 SCIENTIFIC PERMANENT	\$15.0	\$14.8	\$9.3	\$9.4	\$8.5	\$9.0
607 UNIVERSITY PERMANENT	\$4.8	\$2.9	\$1.6	\$1.6	\$1.4	\$1.4
	-----	-----	-----	-----	-----	-----
	\$38.7	\$33.6	\$26.9	\$27.0	\$23.7	\$28.2
TOTAL TO TRUST BENEFICIARY FUNDS	\$463.1	\$396.1	\$343.0	\$343.5	\$291.0	\$324.4
TOTAL ALL FUNDS	\$627.1	\$529.7	\$458.0	\$458.7	\$390.7	\$435.2

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01 (preliminary), and \$50.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.